PATENT
Attorney Docket No.: 015280-415100US
Client Ref. No.: E-128-2000/0-US-02

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:	Confirmation No. 9099
Samir N. Khleif *et al.*	Examiner: Marianne Dibrino
Application No.: 09/810,310	Technology Center/Art Unit: 1644
Filed: March 14, 2001	**DECLARATIO UNDER**
For: METHODS AND COMPOSITIONS FOR CO-STIMULATION OF IMMUNOLOGICAL RESPONSES TO PEPTIDE ANTIGENS	
Customer No.: 45115	

BWP
015280-415100US

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I, Jay Berzofsky, declare and state as follows:

1. I am a co-inventor of the subject matter of U.S. Patent Application No. 09/810,310, entitled "Methods and Compositions for Co-stimulation of Immunological Responses to Peptide Antigens" (hereinafter "the '310 application" or "the application").

2. I currently hold the position of Chief, Vaccine Branch of the Center for Cancer Research at the National Cancer Institute, National Institutes of Health. I have a Ph.D. in Molecular Biology as well as an M.D. from the Albert Einstein College of Medicine. I have 34 years of post-graduate scientific and biomedical experience, including, for example, in the areas of antigen recognition by T lymphocytes; antigen processing and presentation; vaccine design and development based on immunological principles, peptide synthesis, and recombinant DNA technology; and AIDS, malaria, and cancer vaccines. I have also held editorial positions on several peer review scientific journals, including the Journal of Immunology, Journal of Molecular and Cellular Immunology, Molecular Immunology, Peptide Research, International

Immunology, and Clinical Immunology, among others. I have co-authored over 410 scientific papers in the areas of molecular and cellular biology, immunology, and vaccine research. A copy of my curriculum vitae is attached hereto as Exhibit 1.

3. As a co-inventor of the subject matter described in the '310 application, and as a researcher in the fields of immunology and vaccine design (*see* ¶2), I am a person of skill in the art to which the invention as claimed in the application pertains.

4. I have read the Office Action dated May 17, 2007 ("Office Action") issued by Examiner Dibrino.

5. I understand from the Office Action that the pending claims 1, 2, 6, 11, 12 and 14-17 stand rejected as allegedly obvious over Corr *et al.* (*J. Exp. Med.* 184:1555-1560, 1996) (referred to hereafter as "Corr (1996)") in view of Corr *et al.* (*J. Immunol.* 159:4999-5004, 1997) (referred to hereafter as "Corr (1997)"). In addition, I understand from the Office Action that pending claims 7 and 8 stand rejected as allegedly obvious over Corr (1996) in view of Corr (1997) as applied to claims 1, 2, 6, 11, 12 and 14-17 above, and further in view of WO 99/45954 A1.

6. I have read and understand the documents referenced in ¶5 above.

7. I am a co-inventor of the WO 99/45954 reference, also discussed in the Office Action.

8. The statements set forth herein are offered to address the Examiner's remarks in the Office Action and to show that, as of the filing date of the '310 application, the scientific literature and the published patent application discussed in the Office Action would not have led an artisan of ordinary skill to the invention as presently claimed in the application.

9. I have reviewed Corr (1996) and understand the reference to describe the injection of a naked plasmid DNA directly into the muscle cells of mice. The mice were parent→F1 bone marrow chimeras in which H-2^{bxd} recipient mice received bone marrow that

expressed only H-2^b or H-2^d MHC molecules. The plasmid injected into the mice encoded the nucleoprotein from the A/PR/8/34 influenza viral strain. This single viral antigen has epitopes for both the H-$2D^b$ and H-$2K^d$ molecules. The resulting CTL responses were restricted to the MHC haplotype of the bone marrow alone and not to the second haplotype expressed by the recipient mouse's monocytes. The authors of Corr (1996) described their data as showing that the mechanism of priming in their method for vaccination used the MHC from bone marrow-derived antigen presenting cells. None of the experiments described involved the injection of a soluble polyprotein or peptide antigen. The experiments also did not describe the injection of a naked DNA plasmid encoding a co-stimulatory molecule, such as a B7 molecule.

10. The Examiner states in the pending Office Action that Corr (1996) teaches intramuscular injection of a viral protein antigen mixed with naked plasmid DNA encoding B7.1 or B7.2 co-stimulatory molecule. In addition the Examiner states that Corr (1996) teaches that muscle cells at the site of injection do not present antigen to the immune system, but rather professional bone marrow-derived antigen presenting cells present the antigen that results in a CTL response to the antigen.

11. In my review of Corr (1996) I did not find any reference to the injection of a viral protein antigen mixed with naked plasmid DNA encoding a co-stimulatory molecule of any type, much less a B7 family member. Corr (1996) merely describes the injection of a naked DNA plasmid encoding a viral protein having epitopes for two different haplotypes. The plasmids were injected into the muscle of the mice to distinguish whether the muscle cells surrounding the injection site or the circulating antigen presenting cells present the antigen expressed by the transfected muscle cells from the naked plasmid. There is no suggestion or disclosure of the use of a naked plasmid DNA encoding a co-stimulatory molecule in inducing any sort of immune response.

12. The skilled artisan reading Corr (1996) would understand this reference as teaching that intramuscular injection of plasmid DNA encoding the influenza nucleoprotein results in the induction of a influenza nucleoprotein-specific cytotoxic T lymphocyte restricted to the MHC class I molecules expressed by circulating bone marrow-derived antigen presenting

cells. No conclusion can be drawn as to what type of immune response might be induced by a polypeptide antigen injected into a muscle. Further, there is no information regarding the type of immune response that might be induced by either to injection of a combined composition with a naked plasmid expressing a co-stimulatory molecule and a naked plasmid expressing a polypeptide antigen or a combined composition with a naked plasmid expressing a co-stimulatory molecule and a soluble polypeptide antigen. Similarly, there is no information that discloses or suggests the type of immune response that might result from separate injections of the above compositions.

13. The Examiner alleges in the pending Office Action that Corr (1997) teaches the following:

a) that co-expression of B7-1 in the vicinity of a minimal MHC class I-restricted antigen is sufficient to prime a cytotoxic T cell response;

b) that expression of the MHC class I restricted epitope in the same cell as the costimulatory ligand is not imperative for T cell priming, but *in vivo* a T cell cannot be effectively primed with a cognate signal from a peripheral somatic tissue if a second signal stimulus is not available in the immediate vicinity, for example, in the same muscle;

c) that *in vivo* transfection of peripheral somatic tissues with plasmids encoding costimulatory ligands not only enhanced immune responses to coinjected protein antigens, but also dramatically increased the immune response to coinjected protein antigens;

d) that by increasing the density of membrane-bound costimulatory molecules, naked plasmid DNA injection can boost immune responses to soluble protein antigen in a manner analogous to conventional adjuvants, but without apparent systemic side effects;

e) that the plasmid DNA were constructed with a promoter regulatory element for high expression.

14. The Examiner alleges that it would have been obvious to one of ordinary skill in the art at the time the invention was made to have administered the viral protein antigen as taught be Corr (1996) or the CTL peptide epitope taught by Corr (1997) separately from the naked plasmid DNA encoding B7.1 and/or B7.2 to closely adjacent sites as taught by Corr (1997). Further, the Examiner alleges that the skilled artisan would be motivated to administer a naked plasmid DNA expressing a B7 co-stimulatory molecule coordinately with an immunologically effective amount of a peptide or protein antigen comprising one or more T cell epitope(s) separately to closely adjacent sites is equivalent to co-administration. The Examiner further alleges that the skill artisan would be motivated to use the method as claimed in the present invention for convenience and standardization between administrations because the same naked plasmid DNA preparation administered separately could be used for co-ordinate immunizations with different protein or peptide antigens. Still further, the Examiner alleges that Corr (1997) teaches that co-expression of B7-1 in the vicinity of a minimal MHC class I-restricted antigen is sufficient to prime a CTL response, including where the antigen is a protein antigen.

15. In my review of Corr (1997) I found that teaches the co-administration of naked plasmid DNA encoding a B7-1 or B7-2 co-stimulatory molecule with a naked plasmid DNA encoding a MHC class I-restricted peptide primed a specific CTL response. This teaching is set forth in statement (a) by the Examiner in paragraph 14 above. Co-administration of the naked plasmid DNA encoding a B7-1 or B7-2 co-stimulatory molecule with ovalbumin protein at the same site intramuscularly induced an antibody response, not an antigen specific CTL response as alleged by the Examiner. It is in the context of this increase in antibody response that the authors of Corr (1997) conclude that by increasing the local density of membrane bound costimulatory molecules, naked DNA injection can boost immune responses to soluble antigen in a manner analogous to conventional adjuvants. (See page 5001 last paragraph bridging to page 5002). There is no disclosure or suggestion in Corr (1997) that co-administration of naked plasmid DNA encoding a B7 co-stimulatory molecule with a soluble protein antigen or a soluble peptide antigen even at the same site could induce an antigen specific CTL response much less when administered at a separate site. Further, at page 5002, right column, lines 27-30 of the

Discussion the authors conclude that "[b]oth minigene and a co-stimulator gene must be injected into the same muscle site for CTL induction, whereas injection into separate muscles does not induce a response." Again, there is no disclosure or suggestion relating to the induction of a CTL response with co-administration of a co-stimulator gene and a protein or peptide having a CTL epitope. These results are consistent with the understanding in the art that soluble proteins typically induce a type II response and not a type I CTL response.

16. The reasons of the Examiner as set forth in ¶ 14 do not provide sufficient basis for motivating the skilled artisan to the invention recited in the pending claims. In particular, Corr (1996) does not suggest or disclose the administration of a protein or peptide at all. In fact, as stated above, Corr (1996) disclose the administration only of a naked plasmid DNA. Further, Corr (1997) does show that co-expression of DNA encoding B7-1 and DNA encoding a polypeptide having a T cell epitope can result in the processing of a MHC class I-restricted antigen to prime a CTL response. As above, co-administration of a plasmid encoding either B7-1 or B7-2 with ovalbumin at the same site resulted in the induction of an antigen specific antibody response, not a cytotoxic T cell response. Administration of a mixture of a plasmid encoding a co-stimulatory molecule, such as a B7 family member, and either a plasmid encoding a polypeptide having a T cell epitope or a soluble protein having a B cell epitope is not the same as the separate administration of a soluble peptide having a T cell epitope and a DNA plasmid encoding B7 at closely adjacent sites.

17. The Examiner has also combined Corr (1996) and Corr (1997) with the disclosure of WO 99/45954 A1 to reject claims 7 and 8 as obvious. In this rejection, the Examiner alleges that the teachings of the combined Corr references described above do not teach viral antigen from HBV, HSV, or HPV. But, that the alleged teachings of WO 99/45954 include epitopes on antigens from, for example, HBV, HCV, HPV and HSV that are useful in pharmaceutical compositions for both therapeutic and diagnostic methods, and that further teachings disclose that the identified peptides bind to class I HLA molecules. It is alleged by the Examiner that an artisan of ordinary skill would be motivated to utilize the epitopes and proteins

disclosed in WO 99/45954 in the "improved" methods for generating an effective immune response.

18. As above, I have reviewed the Corr (1996) and Corr (1997). Corr (1996) does not teach a method for co-administration of a naked DNA encoding a B7 co-stimulator molecule with a peptide antigen of any kind. Further, the only teachings in Corr (1997) that relate to the co-administration of a naked DNA encoding a B7 co-stimulatory molecule and a polypeptide or protein disclose the induction of an antibody response and not an antigen specific cytotoxic T cell response. As such, there is no disclosure or suggestion to one of ordinary skill in the art to combine the references with any epitope or antigen disclosed in WO 99/4594 A1 to separately inject a naked DNA encoding a B7 co-stimulatory molecule to a closely adjacent site to induce an antigen specific CTL response.

19. It is my opinion that at the time of filing of the instant application, for *in vivo* administration of two separate agents targeting the same cell, it was typical to use the agents together as an admixture, rather than as individual formulations administered separately. In the absence of any specific teaching or suggestion to the contrary, and assuming (for argument's sake) a general teaching of *in vivo* administration, one of skill in the art would be led to administer B7 DNA and peptide antigen molecules together as an admixture, or coupled, but not separately. The teaching in Corr (1997) was that the two components had to be mixed in the same syringe for injection, not at closely adjacent sites, and that they did not work at more distant sites. Fig. 4 of Corr (1997) demonstrated a successful result only when the plasmids were mixed, not given at separate sites. Also, the experiment described in Fig. 5 of Corr (1997) showed the induction of antibody only when the protein and plasmid encoding B7 were mixed and injected together in the same site, not at separate sites. In addition, the experiment as described in Fig. 5 did not address a CTL response at all. Therefore, one of skill in the art would learn from Corr (1997) that separate sites are not effective and that only admixture works for both antibody and CTL responses. This study did not address at all separate administration of a soluble peptide or the administration of even two plasmids at closely adjacent but separate sites.

20. None of the proposed motivations enumerated by the Examiner are specific enough or have sufficient force to lead one of ordinary skill in the art to the particular invention as presently claimed in the application. These proposed motivations do not specifically lead the artisan to administration of a peptide antigen and nucleic acid encoding B7 separately at closely adjacent sites.

21. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that I make these statements with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements my jeopardize validity of the application or any patent issuing therefrom.

Executed this 16th day of October, 2007

By: _____
Name: Jay A. Berzofsky, M.D., Ph.D.
Title: Chief, Vaccine Branch of the Center for Cancer Research, National Cancer Institute, National Institutes of Health

CURRICULUM VITAE

Name: Jay Arthur Berzofsky

Date and Place of Birth: April 13, 1946, Baltimore, Maryland

Marital Status: Married to Sharon M. Miller; two children
Alexander, April 30, 1974, and Marcus, May 27, 1976

Education:

1967 - A.B., Harvard University (Summa Cum Laude in Chemistry)
1971 - Ph.D., Albert Einstein College of Medicine, Molecular Biology
1973 - M.D., Albert Einstein College of Medicine, Medical Scientist Training Program

Brief Chronology of Employment:

1973 - 1974	Medical Internship (Straight Medicine), Massachusetts General Hospital, Boston, Massachusetts
1974 - 1976	Research Associateship, Laboratory of Chemical Biology National Institute of Arthritis, Metabolism, and Digestive Diseases, National Institutes of Health
1976 - 1979	Investigator ("Expert"), Metabolism Branch, National Cancer Institute, National Institutes of Health
1979 - 1987	Senior Investigator, Metabolism Branch, National Cancer Institute, National Institutes of Health
1987 - 2003	Chief, Molecular Immunogenetics and Vaccine Research Section, Metabolism Branch, National Cancer Institute, National Institutes of Health
2004 – Date	Chief, Vaccine Branch, Center for Cancer Research, National Cancer Institute, National Institutes of Health

Honors/Awards:

Detur Prize, Harvard University, 1964
Harvard College Scholarship, Harvard University, 1964
Phi Beta Kappa, Junior Year, Harvard University, 1966
Summa Cum Laude in Chemistry, Harvard University, 1967
Sophia Freund Prize for Graduate with Highest Cumulative Grade Point Average, Harvard College, 1967
NIH Special Achievement Award, 1982
Hollister - Stier's Distinguished Lectureship, Washington State

University, 1986
J. W. McLaughlin Fund Distinguished Contributions to Immunology Lectureship, University of Texas Medical School, Galveston, 1987
U. S. Public Health Service Superior Service Award, 1988
31st Michael Heidelberger Award and Lecture, Columbia University, 1992
McLaughlin Visiting Professorship, University of Texas Medical School, Galveston, 1992
American Society for Clinical Investigation, President 1993-94
Fellow of the American Association for the Advancement of Science, 1995
Cytokine Interest Group Best Paper of 2000 Award to fellow in lab, 2001
The 2004 Tadeusz J. Wiktor Memorial Lecture, Wistar Institute, University of Pennsylvania, Philadelphia, PA., November 17, 2004
Chair, Medical Sciences Section, American Association for the Advancement of Science, 2007-2008
The Herschel Zackheim Lectureship Award, International Society for Cutaneous Lymphomas, 2007
Distinguished Alumnus of the Year Award 2007, Albert Einstein College of Medicine

Professional Society Memberships:

Association of Harvard Chemists, 1967 - present
New York Academy of Sciences, 1971 - present
American Association of Immunologists, 1977 - present
Undersea Medical Society, 1978 - 1988
American Federation for Clinical Research, 1979 - present
American Society of Biological Chemists, 1980 - present
American Society for Clinical Investigation, 1983 - present,
Secretary-Treasurer, 1989 - 1992
President-elect, 1992-1993
President, 1993-94
Association of American Physicians, 1990 – present
American Association for the Advancement of Science, Fellow; Chair of Medical Sciences Section, 2007-2008
Faculty of 1000, 2006-present

Editorial Positions:

Associate Editor, *Journal of Immunology*, 1980 - 1984
Editorial Advisory Board, *Journal of Molecular and Cellular Immunology*, 1983-88
Advisory Editor, *Molecular Immunology*, 1985 - 1988
Editorial Board, *Peptide Research*, 1987 - present
Transmitting Editor, *International Immunology*, 1988 - 2000
Editorial Board, *Journal of Human Virology*, 1997-present
Consulting Editor, *Journal of Clinical Investigation*, 1998-2005
Section Editor, *Clinical Immunology*, 2002-present
Associate Editor, *Clinical Cancer Research*, 2002-present

Professional Committees and Activities:

American Association of Immunologists, Membership Committee, 1981 - 1988
American Association of Immunologists, Chairman of Membership Committee, 1983 - 1988
NIH Clinical Center Compensable Events Committee, 1982 - present
American Society for Clinical Investigation, Council, 1989-1994
NCI Division of Clinical Sciences Promotion and Tenure Committee, 1995-2001.
NCI Division of Clinical Sciences Research Advisory Group, 1995-2001
NCI Director's Intramural Advisory Board, 1997-99
NIH AIDS Vaccine Research Center Steering Committee, 1997-present
NIH Search Committee for Director of Office of AIDS Research, 1997-98
NIAID Malaria Vaccine Task Force, 1998-present
NCI Vaccine Working Group, Chairman/Organizer, 1998-present
NCI/CCR Immunology Faculty Steering Committee, 2001-present
NCI/CCR HIV & Virology Faculty Steering Committee, 2001-present
NCI/CCR Frontiers in Science Newsletter Editorial Board, 2001-present.
NCI/NIH Committee for Biodefense, founding member, 2001-present.
NCI Center of Excellence in Immunology, Steering Committee, 2003-present.
NIH CRADA 01361 with Genzyme Corporation. Co-principal Investigator, 2003-present
Advisory Committee, Harvard Blood Center, 2004-present
External Advisory Committee, University of London, 2006-present.
NIH Director's Biennial Report to Congress, 2007, Team Leader for Cancer topic.

Military Service:

Commissioned Corps, United States Public Health Service, 1974 - 1976

Other Research Experience:

Summers,1962 - 1965 Research Assistant, Pediatric Research Unit (H. M. Nitowsky), Sinai Hospital, Baltimore, Maryland
Summer, 1966 Research Assistant, Organic Synthesis Laboratory C. H. Robinson), Department of Pharmacology, Johns Hopkins School of Medicine, Baltimore, Maryland
Summer, 1967 Visiting Scientist, Laboratoire d'Enzymologie (G. N. Cohen), Centre National de la Recherche Scientifique, Gif-sur-Yvette, France

Medical Licensure: Maryland and Massachusetts

Major Outside Activities (Not permitted by NIH after 2005)

Medimmune, Inc.—Scientific Founder and Chair, Scientific Advisory Board, 1989-2002
Magainin Pharmaceuticals, Inc.—Member, Scientific Advisory Board, 1991-97
Diacrin, Inc.—Member, Scientific Advisory Board, 1993-2002
Pharmadyne, Inc.—Scientific Co-Founder and Chair, Scientific Advisory Board, 1997-2004
Boston University Community Technology Fund—Consultant, 1997-1999
Health Care Ventures, Inc.—consultant, 1998

EMD Pharmaceuticals, Inc.—consultant, 2000-2003
Epivax, Inc.—Member, Scientific Advisory Board, 2000-2004
Therapeutic Devices, Inc.—consultant, 2002-2004
Transform Pharmaceuticals, Inc.—consultant 2002-2005
Celera Genomics, Inc.—consultant 2002-2004
Genencor International, Inc.—consultant 2003-2004.

Major areas of research:

1. Molecular basis of antigen recognition by T lymphocytes
2. Processing of antigens and their presentation by major histocompatibility molecules
3. Structure of antigenic sites on protein antigens
4. Genetic regulation of the immune response
5. Design and development of artificial vaccines based on immunological principles and peptide synthesis or recombinant DNA technology
6. AIDS vaccines and diagnostic techniques
7. Malaria vaccines
8. Cancer vaccines
9. Antigen-antibody interactions
10. Structure-function relationships in proteins and protein conformation.
11. Regulation of tumor immunosurveillance and T cell function by cytokines
12. Mucosal immunity and vaccines

BIBLIOGRAPHY

Jay Arthur Berzofsky

1. Nitowsky, H.M., L. Matz, and J.A. Berzofsky. 1966. Studies on oxidative drug metabolism in the full-term newborn infant. *J. Pediatrics* 69:1139-1149.

2. Berzofsky, J.A., J. Peisach, and W.E. Blumberg. 1971. Sulfheme proteins. I. Optical and magnetic properties of sulfmyoglobin and its derivatives. *J. Biol. Chem.* 246:3367-3377.

3. Peisach, J., J.A. Berzofsky, and W.E. Blumberg. 1973. Electronic control of oxygen binding to heme proteins. In Proceedings of the Second International Symposium on Oxidases and Related Oxidation-Reduction Systems. T.E. King, H.S. Mason, and M. Morrison, editors. University Park Press, Baltimore. 265-278.

4. Berzofsky, J.A. 1971. The nature of sulfmyoglobin: Chemical, physical, and oxygen-binding properties. Albert Einstein College of Medicine, New York.

5. Berzofsky, J.A., J. Peisach, and W.E. Blumberg. 1971. Sulfheme proteins II. The reversible oxygenation of ferrous sulfmyoglobin. *J. Biol. Chem.* 246:7366-7372.

6. Berzofsky, J.A., J. Peisach, and J.O. Alben. 1972. Sulfheme proteins. III. Carboxysulfmyoglobin: The relation between electron withdrawal from iron and ligand binding. *J. Biol. Chem.* 247:3774-3782.

7. Berzofsky, J.A., J. Peisach, and B.L. Horecker. 1972. Sulfheme proteins. IV. The stoichiometry of sulfur incorporation and the isolation of sulfhemin, the prosthetic group of sulfmyoglobin. *J. Biol. Chem.* 247:3783-3791.

8. Berzofsky, J.A., A.N. Schechter, and H. Kon. 1976. Does Freund's adjuvant denature protein antigens? EPR studies of emulsified hemoglobin. *J. Immunol.* 116:270-273.

9. Berzofsky, J.A., J.G. Curd, and A.N. Schechter. 1976. Probability analysis of the interaction of antibodies with multideterminant antigens in radioimmunoassay: application to the amino terminus of the beta chain of hemoglobin S. *Biochem* 15:2113-2121.

10. Berzofsky, J.A., A.N. Schechter, G.M. Shearer, and D.H. Sachs. 1977. Genetic control of the immune response to staphyloccal nuclease III. Time course and correlation between the response to native nuclease and the response to its polypeptide fragments. *J. Exp. Med.* 145:111-112.

11. Berzofsky, J.A., A.N. Schechter, G.M. Shearer, and D.H. Sachs. 1977. Genetic control of the immune response to staphylococcal nuclease IV. H-2-linked control of the relative proportions of antibodies produced to different determinants of native nuclease. *J. Exp. Med.* 145:123-145.

12 Sachs, D.H., J.A. Berzofsky, C.G. Fathman, D.S. Pisetsky, A.N. Schechter, and R.H. Schwartz. 1976. The immune response to staphylococcal nuclease: A probe of cellular and humoral antigen specific receptors. *Cold Spring Harbor Symp. Quant. Biol.* 41:295-306.

13. Berzofsky, J.A., R.H. Schwartz, A.N. Schechter, and D.H. Sachs. 1978. H-2 linked control of the antibody and cellular immune response to nuclease at the level of individual regions of the molecule. In *Ir Genes and Ia Antigens* (Proceedings of the Third Ir Gene Workshop, December, 1976, Asilomar, CA). H.O. McDevitt, editor. Academic Press, New York. 423-431.

14. Berzofsky, J.A. 1978. Genetic control of the immune response to mammalian myoglobins in mice I. More than one I-region gene in H-2 controls the antibody response. *J. Immunol.* 120(2):360-369.

15. Pisetsky, D.S., J.A. Berzofsky, and D.H. Sachs. 1978. Genetic control of the immune response to staphylococcal nuclease. VII. Role of non-H-2-linked genes in the control of the anti-nuclease antibody response. *J. Exp. Med.* 147(2):396-408.

16. Berzofsky, J.A. 1978. The assessment of antibody affinity from radioimmunoassay. *Clinical Chem.* 24(3):419-421.

17. Berzofsky, J.A. 1978. Genetic control of the antibody response to sperm whale myoglobin in mice. *Adv. Exp. Med. Biol.* 98:225-240.

18. Berzofsky, J.A., D.S. Pisetsky, R.H. Schwartz, A.N. Schechter, and D.H. Sachs. 1978. Genetic control of the immune response to staphylococcal nuclease in mice. *Adv. Exp. Med. Biol.* 98:241-258.

19. Schwartz, R.H., J.A. Berzofsky, C.L. Horton, A.N. Schechter, and D.H. Sachs. 1978. Genetic control of the T-lymphocyte proliferative response to staphylococcal nuclease. Evidence for multiple MHC-linked Ir gene control. *J. Immunol.* 120:1741-1749.

20. Sachs, D.H., J.A. Berzofsky, D.S. Pisetsky, and R.H. Schwartz. 1978. Genetic control of the immune response to staphylococcal nuclease. In *Seminars in Immunopathology* Vol.I. B. Benacerraf, editor. Springer-Verlag , New York. 51-83.

21. Berzofsky, J.A., L.K. Richman, and D.J. Killion. 1979. Distinct H-2-linked Ir genes control both antibody and T cell responses to different determinants on the same antigen, myoglobin. *Proc. Natl. Acad. Sci. U. S. A.* 76:4046-4050.

22. Richman, L.K., R.J. Klingenstein, J.A. Richman, W. Strober, and J.A. Berzofsky. 1979. The murine Kupffer cell. I. Characterization of the cell serving accessory function in antigen-specific T cell proliferation. *J. Immunol.* 123:2602-2609.

23. Richman, L.K., W. Strober, and J.A. Berzofsky. 1980. Genetic control of the immune response to myoglobin: III. Determinant-specific, two Ir gene phenotype is regulated by the genotype of reconstituting Kupffer cells. *J. Immunol.* 124:619-624.

24. Berzofsky, J.A. 1980. Immune response genes in the regulation of mammalian immunity. In *Biological Regulation and Development.* R.F. Goldberger, editor. Plenum Press, New York. 467-594.

25. Berzofsky, J.A., G. Hicks, J. Fedorko, and J. Minna. 1980. Properties of monoclonal antibodies specific for determinants of a protein antigen, myoglobin. *J. Biol. Chem.* 255:11188-11191.

26. Berzofsky, J.A., L.K. Richman, and W. Strober. 1982. Determinant-specific antigen presentation by liver Kupffer cells under control of H-2-linked Ir genes. In *Recent Advances in Mucosal Immunity.* W. Strober, L.A. Hanson, and K.W. Sell, editors. Raven Press, New York. 213-223.

27. Berzofsky, J.A., and A.N. Schechter. 1981. The concepts of crossreactivity and specificity in immunology. *Molec. Immunol.* 18:751-763.

28. Berzofsky, J.A., and L.K. Richman. 1981. Genetic control of the immune response to myoglobins. IV. Inhibition of determinant-specific Ir-gene-controlled antigen presentation and induction of suppression by pretreatment of presenting cells with anti-Ia antibodies. *J. Immunol.* 126:1898-1904.

29. Berzofsky, J.A., G.K. Buckenmeyer, G. Hicks, F.R.N. Gurd, R.J. Feldmann, and J. Minna. 1982. Topographic antigenic determinants recognized by monoclonal antibodies to sperm whale myoglobin. *J. Biol. Chem.* 257:3189-3198.

30. Berzofsky, J.A., D.S. Pisetsky, D.J. Killion, G. Hicks, and D.H. Sachs. 1981. Ir genes of different high responder haplotypes for staphylococcal nuclease are not allelic. *J. Immunol.* 127:2453-2455.

31. Berzofsky, J.A., G.K. Buckenmeyer, G. Hicks, D.J. Killion, I. Berkower, Y. Kohno, M.A. Flanagan, M.R. Busch, R.J. Feldmann, J. Minna, and F.R.N. Gurd. 1983. Topographic antigenic determinants detected by monoclonal antibodies to myoglobin. In *Protein Conformation as Immunological Signal.* F. Celada, E. Sercarz, and V. Shumaker, editors. Plenum Press, New York. 165-180.

32. Berkower, I., G.K. Buckenmeyer, F.R.N. Gurd, and J.A. Berzofsky. 1983. A possible immunodominant domain of myoglobin for murine T lymphocytes. In *Protein Conformation as Immunological Signal.* F. Celada, E. Sercarz, and V. Shumaker, editors. Plenum Press, New York. 289-302.

33. Berzofsky, J.A., G.K. Buckenmeyer, and G. Hicks. 1982. Genetics control of the immune response to myoglobins. VI. Distinct Ir genes for different myoglobins: Complementing genes in I-A and H-2D for equine myoglobin. *J. Immunol.* 128:737-741.

34. Kohno, Y., I. Berkower, J. Minna, and J.A. Berzofsky. 1982. Idiotypes of anti-myoglobin antibodies: Shared idiotypes among monoclonal antibodies to distinct determinants of sperm whale myoglobin. *J. Immunol.* 128:1742-1748.

35. Berzofsky, J.A., and I. Berkower. 1983. Antigen-Antibody Interaction. In *Fundamental Immunology*. W.E. Paul, editor. Raven Press, New York. 595-644.

36. Kohno, Y., and J.A. Berzofsky. 1982. Genetic control of the immune response to myoglobin. V. Antibody production in vitro is macrophage and T cell-dependent and is under control of two determinant-specific Ir genes. *J. Immunol.* 128:2458-2464.

37. Lando, G., J.A. Berzofsky, and M. Reichlin. 1982. Antigenic structure of sperm whale myoglobin: I. Partition of specificities between antibodies reactive with peptides and native protein. *J. Immunol.* 129:206-211.

38. Berkower, I., G.K. Buckenmeyer, F.R.N. Gurd, and J.A. Berzofsky. 1982. A possible immunodominant epitope recognized by murine T lymphocytes immune to different myoglobins. *Proc. Natl. Acad. Sci. U. S. A.* 79:4723-4727.

39. Kohno, Y., and J.A. Berzofsky. 1982. Genetic control of the immune response to myoglobins. Both low and high responder T cells tolerant to the other MHC help high but not low responder B cells. *J. Exp. Med.* 156:791-809.

40. Simmerman, H.K.B., C.C. Wang, E.M. Horwitz, J.A. Berzofsky, and F.R.N. Gurd. 1982. Semisynthesis of sperm whale myoglobin by fragment condensation. *Proc. Natl. Acad. Sci. U. S. A.* 79:7739-7743.

41. Kohno, Y., and J.A. Berzofsky. 1982. Genetic control of immune response to myoglobin. Ir gene function in genetic restriction between T and B lymphocytes. *J. Exp. Med.* 156:1486-1501.

42. Berzofsky, J.A., Y. Kohno, and H. Kawamura. 1983. Both low and high responder myoglobin-specific T cells, tolerant to F1, help high but not low responder B cells. In *Ir Genes: Past, Present, and Future*. C.W. Pierce, S.E. Cullen, J.A. Kapp, B.D. Schwartz, and D.C. Shreffler, editors. Humana Press, New Jersey. 269-275.

43. Berzofsky, J.A. 1983. T-B reciprocity: An Ia-restricted epitope-specific circuit regulating T cell-B cell interaction and antibody specificity. *Survey of Immunol. Res.* 2:223-229.

44. Berzofsky, J.A. 1984. Monoclonal antibodies as probes of antigenic structure. In *Monoclonal Antibodies as Probes of Antigenic Structure, Receptor Biochemistry and Methodology* Vol. 4. J.C. Venter, C.M. Fraser, and J.M. Lindstrom, editors. Alan R. Liss, Inc., New York. 1-19.

45. Berzofsky, J.A. 1983. T cell activation by antigen. *Immunol. Today* 4:299-301.

46. Venter, J.C., J.A. Berzofsky, J. Lindstrom, S. Jacobs, C.M. Fraser, L.D. Kohn, W. Schnieder, G.L. Greene, A.D. Strosberg, and B.F. Erlanger. 1984. Monoclonal and anti-idiotypic antibodies as probes for receptor structure and function. *Fed. Proc.* 43:2534-2539.

47. Berzofsky, J.A. 1984. Mechanisms of antigen-specific, genetically restricted, T cell-B cell interaction. *Survey of Immunol. Res.* 3:103-106.

48. Benjamin, D.C., J.A. Berzofsky, I.J. East, F.R.N. Gurd, C. Hannum, S.J. Leach, E. Margoliash, J.G. Michael, A. Miller, E.M. Prager, M. Reichlin, E.E. Sercarz, S.J. Smith-Gill, P.E. Todd, and A.C. Wilson. 1984. The antigenic structure of proteins: A reappraisal. *Annu. Rev. Immunol.* 2:67-101.

49. Berkower, I., L.A. Matis, G.K. Buckenmeyer, F.R.N. Gurd, D.L. Longo, and J.A. Berzofsky. 1984. Identification of distinct predominant epitopes recognized by myoglobin-specific T cells under control of different Ir genes and characterization of representative T-cell clones. *J. Immunol.* 132:1370-1378.

50. Kawamura, H., Y. Kohno, M. Busch, F.R.N. Gurd, and J.A. Berzofsky. 1984. A major anti-myoglobin idiotype: Influence of H-2-linked Ir genes on idiotype expression. *J. Exp. Med.* 160:659-678.

51. Streicher, H.Z., I.J. Berkower, M. Busch, F.R.N. Gurd, and J.A. Berzofsky. 1984. The role of antigen conformation in determining requirements for antigen processing for T cell activation. In *Regulation of the Immune System.* E. Sercarz, H. Cantor, and L. Chess, editors. Alan R.Liss, Inc., New York. 163-180.

52. Berzofsky, J.A., and H.M. Grey. 1984. MHC-restricted specific antigen presentation to different T cell sets (Th, Ts, Tc). In *Regulation of the Immune System.* E. Sercarz, H. Cantor, and L. Chess, editors. Alan R. Liss, Inc., New York. 189-193.

53. Streicher, H.Z., I.J. Berkower, M. Busch, F.R.N. Gurd, and J.A. Berzofsky. 1984. Antigen conformation determines processing requirements for T-cell activation. *Proc. Natl. Acad. Sci. U. S. A.* 81:6831-6835.

54. Berzofsky, J.A., and K. Yokomuro. 1985. Antigen presenting cells: Workshop Summary. In *Immune Regulation.* M. Feldmann, and N.A. Mitchison, editors. Humana Press, NJ. 369-374.

55. Kohno, Y., H. Kawamura, and J.A. Berzofsky. 1985. A unidirectional carrier effect. *Cellular Immunol.* 92:226-234.

56. Berzofsky, J.A. 1985. The nature and role of antigen processing in T cell activation. In *The Year in Immunology 1984-1985.* J.M. Cruse, and R.E. Lewis,Jr., editors. Karger, Basel. 18-24.

57. Morrissey, P.J., S.O. Sharrow, Y. Kohno, J.A. Berzofsky, and A. Singer. 1985. Correlation of intrathymic tolerance with intrathymic chimerism in neonatally tolerized mice. *Transplant.* 40:68-72.

58. Kawamura, H., S.A. Rosenberg, and J.A. Berzofsky. 1985. Immunization with antigen and interleukin-2 in vivo overcomes Ir genetic low responsiveness. *J. Exp. Med.* 162:381-386.

59. Berkower, I., H. Kawamura, L.A. Matis, and J.A. Berzofsky. 1985. T cell clones to two major T cell epitopes of myoglobin: Effect of I-A/I-E restriction on epitope dominance. *J. Immunol.* 135:2628-2634.

60. Delisi, C., and J.A. Berzofsky. 1985. T cell antigenic sites tend to be amphipathic structures. *Proc. Natl. Acad. Sci. U. S. A.* 82:7048-7052.

61. Berzofsky, J.A. 1985. Intrinsic and extrinsic factors in protein antigenic structure. *Science* 229:932-940.

62. Darst, S.A., C.R. Robertson, and J.A. Berzofsky. 1986. Myoglobin adsorption onto crosslinked polydimethylsiloxane. *Journal of Colloid and Interface Science* 111:466-474.

63. Berzofsky, J.A., I.J. Berkower, K.B. Cease, G.K. Buckenmeyer, H.Z. Streicher, and C. Delisi. 1986. Structural and conformational requirements for protein antigen recognition by MHC class II - restricted T cells and clones. In *Modern Approaches to Vaccines.* F. Brown, R. Chanock, and R. Lerner, editors. Cold Spring Harbor Laboratory, New York. 123-127.

64. Berzofsky, J.A., K.B. Cease, G.K. Buckenmeyer, H.Z. Streicher, C. Delisi, and I.J. Berkower. 1986. Structural and conformational requirements for Ir-gene-controlled myoglobin epitope recognition by Ia-restricted T cells and clones. In *Regulation of Immune Gene Expression.* M. Feldmann, and A. McMichael, editors. Humana Press, Clifton, NJ. 225-234.

65. Kawamura, H., and J.A. Berzofsky. 1986. Enhancement of antigenic potency in vitro and immunogenicity in vivo by coupling the antigen to anti-immunoglobulin. *J. Immunol.* 136:58-65.

66. Streicher, H.Z., F. Cuttitta, G.K. Buckenmeyer, H. Kawamura, J. Minna, and J.A. Berzofsky. 1986. Mapping the idiotopes of a monoclonal anti-idiotypic antibodies: Detection of a common idiotope. *J. Immunol.* 136:1007-1014.

67. Berzofsky, J.A. 1987. *Ir* genes: antigen-specific genetic regulation of the immune response. In *The Antigens.* M. Sela, editor. Academic Press, New York. 1-146.

68. Berkower, I., G.K. Buckenmeyer, and J.A. Berzofsky. 1986. Molecular mapping of a histocompatibility - restricted immunodominant T cell epitope with synthetic and natural peptides: Implications for antigenic structure. *J. Immunol.* 136:2498-2503.

69. Berzofsky, J.A. 1986. Structural features of protein antigenic sites recognized by helper T cells: What makes a site immunodominant?. In *The Year in Immunology 1985-1986.* J.M. Cruse, and R.E. Lewis,Jr., editors. Karger, Basel. 28-38.

70. Simpson, E., R. Lieberman, I. Ando, D.H. Sachs, W.E. Paul, and J.A. Berzofsky. 1986. How many class II Immune Response Genes? A reappraisal of the evidence. *Immunogenetics* 23:302-308.

71. Delisi, C., J. Cornette, H. Margalit, K. Cease, J. Spouge, and J.A. Berzofsky. 1987. The role of amphipathicity as an indicator of T cell antigenic sites on proteins. In *Immunogenicity of Protein Antigens: Repertoire and Regulation.* E. Sercarz, and J.A. Berzofsky, editors. CRC Press, Boca Raton. 35-42.

72. Berzofsky, J.A., J. Cornette, H. Margalit, I. Berkower, K. Cease, and C. Delisi. 1986. Molecular features of class II MHC-restricted T cell recognition of protein and peptide antigens: the importance of amphipathic structures. In *Current Topics in Microbiology and Immunology* Vol. 130. F. Melchers, and H. Koprowski, editors. Springer-Verlag, New York. 14-24.

73. Kawamura, H., S.O. Sharrow, D.W. Alling, D. Stephany, J. York-Jolley, and J.A. Berzofsky. 1986. IL-2 receptor expression in unstimulated murine splenic T cells: Localization to L3T4+ cells and regulation by non-H-2-linked genes. *J. Exp. Med.* 86:1376-1390.

74. Wagner, D.K., J. York-Jolley, T.R. Malek, J.A. Berzofsky, and D.L. Nelson. 1986. Antigen-specific murine T cell clones produce soluble interleukin 2 receptor on stimulation with specific antigens. *J. Immunol.* 137:592-596.

75. Good, M.F., J.A. Berzofsky, W.L. Maloy, Y. Hayashi, N. Fujii, W.T. Hockmeyer, and L.H. Miller. 1986. Genetic control of the immune response in mice to a Plasmodium facilparum sporozoite vaccine: Widespread non-responsiveness to a single malaria T epitope in highly repetitive vaccine. *J. Exp. Med.* 164:655-660.

76. Berzofsky, J.A., K.B. Cease, I.J. Berkower, H. Margalit, J. Cornette, J. Spouge, C. Spencer, G. Buckenmeyer, H. Streicher, M. Kojima, and C. Delisi. 1988. The role of MHC and amphipathic structures in T cell recognition: Features determining immunodominance. In *Antigen Processing and Presentation.* H. Vogel, B. Pernis, and S. Silverstein, editors. Columbia University Press, New York. 125-131.

77. Finnegan, A., M.A. Smith, J.A. Smith, J.A. Berzofsky, D.H. Sachs, and R.J. Hodes. 1986. The T cell repertoire for recognition of a phylogenetically distant protein antigen: peptide specificity and MHC restriction of staphylococcal nuclease specific T cell clones. *J. Exp. Med.* 164:897-910.

78. Kawamura, H., and J.A. Berzofsky. 1987. Influence of MHC-linked genes on idiotype expression. In *Immunogenicity of Protein Antigens: Repertoire and Regulation* Vol.2. E.E. Sercarz, and J.A. Berzofsky, editors. CRC Press, Boca Raton. 121-127.

79. Berzofsky, J.A., K.B. Cease, I.J. Berkower, H. Margalit, J. Cornette, and C. Delisi. 1986. Immunodominance of amphipathic peptides and their localization on the cell surface for antigen presentation to helper T cells. In *Progress in Immunology V.* B. Cinader, and R.G. Miller, editors. Academic Press, New York. 255-265.

80. Cease, K.B., I. Berkower, J. York-Jolley, and J.A. Berzofsky. 1986. T cell clones specific for an amphipathic alpha helical region of sperm whale myoglobin show differing fine specificities for synthetic peptides: A multi-view/single structure interpretation of immunodominance. *J. Exp. Med.* 164:1779-1784.

81. Cease, K.B., G. Buckenmeyer, I. Berkower, J. York-Jolley, and J.A. Berzofsky. 1986. Immunologically relevant peptide antigen exists on the presenting cell in a manner accessible to macromolecules in solution. *J. Exp. Med.* 164:1440-1454.

82. Berzofsky, J.A., and K.B. Cease. 1986. Peptide antigenic structure and localization on the surface of the presenting cell for antigen presentation. *Annales de l`Institut Pasteur* 137D:312-316.

83. Berzofsky, J.A., K.B. Cease, S. Ozaki, H. Margalit, J.L. Cornette, J. Spouge, and C. Delisi. 1987. Helper T cell immunity: Implications for vaccines. In *Vaccines`87.* R. Chanock, F. Brown, H. Ginsberg, and R. Lerner, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York. 26-32.

84. Finnegan, A., and J.A. Berzofsky. 1986. Antigen recognition by T cells. *Immunol. Today* 7:317-319.

85. Spouge, J.L., H.R. Guy, J.L. Cornette, H. Margalit, K. Cease, J.A. Berzofsky, and C. Delisi. 1987. Strong conformational propensities enhance T-cell antigenicity. *J. Immunol.* 138:204-212.

86. Good, M.F., I.A. Quakyi, A. Saul, J.A. Berzofsky, R. Carter, and L.H. Miller. 1987. Human T clones reactive to the sexual stages of Plasmodium falciparum malaria: High frequency of gamete-reactive T cells in peripheral blood of non-exposed donors. *J. Immunol.* 138:306-311.

87. Coico, R.F., J.A. Berzofsky, J. York-Jolley, S. Ozaki, G.W. Siskind, and G.J. Thorbecke. 1987. Physiology of IgD. VII. Induction of receptors for IgD on cloned T cells by IgD and Interleukin 2. *J. Immunol.* 138:4-6.

88. Ozaki, S., J. York-Jolley, H. Kawamura, and J.A. Berzofsky. 1987. Cloned protein antigen-specific, Ia-restricted T cells with both helper and cytolytic activities: Mechanisms of activation and killing. *Cellular Immunol.* 105:301-316.

89. Good, M.F., J.A. Berzofsky, L. Maloy, M.N. Lunde, Y. Hayashi, N. Fujii, W.T. Hockmeyer, B. Moss, and L.H. Miller. 1987. Genetic control of the immune response to a Plasmodium falciparum sporozoite vaccine and to the Cirumsporozoite (CS) protein. In

Vaccines '87. R. Chanock, F. Brown, H. Ginsberg, and R. Lerner, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York . 81-85.

90. Margalit, H., J.L. Spouge, J.L. Cornette, K. Cease, C. Delisi, and J.A. Berzofsky. 1987. Prediction of immunodominant helper T-cell antigenic sites from the primary sequence. *J. Immunol.* 138:2213-2229.

91. Takacs, L., J.A. Berzofsky, J. York-Jolley, T. Akahoshi, E. Blasi, and S.K. Durum. 1987. IL 1-Induction by murine T cell clones: Detection of an IL 1-inducing lymphokine. *J. Immunol.* 138:2124-2131.

92. Good, M.F., W.L. Maloy, M.N. Lunde, H. Margalit, J.L. Cornette, G.L. Smith, B. Moss, L.H. Miller, and J.A. Berzofsky. 1987. Construction of a synthetic immunogen: use of a new T-helper epitope on malaria circumsporozoite protein. *Science* 235:1059-1062.

93. Hoffman, S.L., L.T. Cannon, J.A. Berzofsky, W.R. Majarian, J.G. Young, W.L. Maloy, and W.T. Hockmeyer. 1987. Plasmodium falciparum: Increased immunity with T cell epitope on sporozoite vaccine. *Exp. Parasitology* 64:64-70.

94. Cornette, J.L., K.B. Cease, H. Margalit, J.L. Spouge, J.A. Berzofsky, and C. Delisi. 1987. Hydrophobicity scales and computational techniques for detecting amphipathic structures in proteins. *J. Mol. Biol.* 195:659-686.

95. Cease, K.B., H. Margalit, J.L. Cornette, S.D. Putney, W.G. Robey, C. Ouyang, H.Z. Streicher, P.J. Fischinger, R.C. Gallo, C. Delisi, and J.A. Berzofsky. 1987. Helper T cell antigenic site identification in the AIDS virus gp120 envelope protein and induction of immunity in mice to the native protein using a 16-residue synthetic peptide. *Proc. Natl. Acad. Sci. USA* 84:4249-4253.

96. Ozaki, S., and J.A. Berzofsky. 1987. Antibody conjugates mimic specific B cell presentation of antigen: Relationship between T and B cell specificity. *J. Immunol.* 138:4133-4142.

97. Berzofsky, J.A., K.B. Cease, J.L. Cornette, J.L. Spouge, H. Margalit, I.J. Berkower, M.F. Good, L.H. Miller, and C. Delisi. 1987. Protein antigenic structures recognized by T cells: Potential applications to vaccine design. *Immunol. Rev.* 98:9-52.

98. Berzofsky, J.A. 1988. Features of T-cell recognition and antigen structure useful in the design of vaccines to elicit T-cell immunity. *Vaccines* 6:89-93.

99. Berzofsky, J.A., and S. Ozaki. 1988. Antibody conjugates mimic specific B-cell presentation of antigen: epitope restrictions in specific T-B interaction. In *Antigen Presenting Cells: Diversity, Differentiation and Regulation.* L.B. Schook, and J.G. Tew, editors. Alan R. Liss, Inc., New York. 41-48.

100. Good, M.F., D. Pombo, I.A. Quakyi, E.M. Riley, R.A. Houghten, A. Menon, D.W. Alling, J.A. Berzofsky, and L.H. Miller. 1988. Human T cell recognition of the circumsporozoite

protein of *Plasmodium falciparum*. Immunodominant T cell domains map to the polymorphic regions of the molecule. *Proc. Natl. Acad. Sci. USA* 85:1199-1203.

101. Good, M.F., J.A. Berzofsky, and L.H. Miller. 1988. The T-cell response to the malaria circumsporozoite protein: an immunological approach to vaccine development. *Annu. Rev. Immunol.* 6:663-688.

102. Lin, J., J.A. Berzofsky, and T.L. Delovitch. 1988. Ultrastructural study of internalization and recycling of antigen by antigen presenting cells. *J. Mol. Cell. Immunol.* 3:321-343.

103. Kojima, M., K.B. Cease, G.K. Buckenmeyer, and J.A. Berzofsky. 1988. Limiting dilution comparsion of the repertoires of high and low responder MHC-restricted T cells. *J. Exp. Med.* 167:1100-1113.

104. Good, M.F., D. Pombo, W.L. Maloy, V.F. De la Cruz, L.H. Miller, and J.A. Berzofsky. 1988. Parasite polymorphism present within minimal T-cell epitopes of Plasmodium falciparum circumsporozoite protein. *J. Immunol.* 140:1645-1650.

105. Takahashi, H., J. Cohen, A. Hosmalin, K.B. Cease, R. Houghten, J. Cornette, C. Delisi, B. Moss, R.N. Germain, and J.A. Berzofsky. 1988. An immunodominant epitope of the HIV gp160 envelope glycoprotein recognized by class I MHC molecule-restricted murine cytotoxic T lymphocytes. *Proc. Natl. Acad. Sci. USA* 85:3105-3109.

106. Darst, S.A., C.R. Robertson, and J.A. Berzofsky. 1988. Adsorption of the protein antigen myoglobin affects the binding of conformation specific monoclonal antibodies. *Biophysical Journal* 53:533-539.

107. Pombo, D., W.L. Maloy, J.A. Berzofsky, and M.F. Good. 1988. Neonatal exposure to immunogenic peptides. Differential susceptibility to tolerance induction of helper T cells and B cells reactive to malarial circumsporozoite peptide epitopes. *J. Immunol.* 140:3594-3598.

108. Berzofsky, J.A. 1988. T-cell recognition of protein and peptide antigens: applications to vaccines development. In *Technological Advances in Vaccine Development*. L. Laskey, editor. Alan R. Liss, Inc., New York, 587-602.

109. Berzofsky, J.A. 1988. Immunodominance in T lymphocyte recognition. *Immunol. Letters* 18:83-92.

110. Ozaki, S., S.K. Durum, K. Muegge, J. York-Jolley, and J.A. Berzofsky. 1988. Production of T-T hybrids from T cell clones: Direct comparison between cloned T cells and T hybridoma cells derived from them. *J. Immunol.* 141:71-78.

111. Brett, S.J., K.B. Cease, and J.A. Berzofsky. 1988. Influences of antigen processing on the expression of the T cell repertoire: Evidence for MHC-specific hindering structures on the products of processing. *J. Exp. Med.* 168:357-373.

112. Good, M.F., D. Pombo, M.N. Lunde, W.L. Maloy, R. Halenbeck, K. Koths, L.H. Miller, and J.A. Berzofsky. 1988. Recombinant human interleukin-2 (IL-2) overcomes genetic nonresponsiveness to malaria sporozoite peptides. Correlation of effect with biological activity of IL-2. *J. Immunol.* 141:972-977.

113. Cease, K.B., and J.A. Berzofsky. 1990. T cell immunity and vaccine engineering: Application to the AIDS virus. In *AIDS Vaccine Research and Clinical Trials*. S. D. Putney, and D. P. Bolognesi, editors. Marcell Dekker, New York, pp. 139-156.

114. Kumar, S., L.H. Miller, I.A. Quakyi, D.B. Keister, R.A. Houghten, W.L. Maloy, B. Moss, J.A. Berzofsky, and M.F. Good. 1988. Cytotoxic T cells specific for the circumsporozoite protein of Plasmodium falciparum. *Nature* 334:258-260.

115. Berzofsky, J.A., A. Bensussan, K.B. Cease, J.F. Bourge, R. Cheynier, Z. Lurhuma, J.-J. Salaün, R.C. Gallo, G.M. Shearer, and D. Zagury. 1988. Antigenic peptides recognized by T lymphocytes from AIDS viral envelope-immune humans. *Nature* 334:706-708.

116. Margalit, H., C. Delisi, and J.A. Berzofsky. 1990. Computer predictions of T-cell epitopes. In *New Generation Vaccines*. G.C. Woodrow, and M.M. Levine, editors. Marcel Dekker, New York, 109-116.

117. Berzofsky, J.A. 1989. Structural features of T-cell recognition: Applications to vaccine design. *Phil. Trans. Roy. Soc. London B.* , 323: 535-544.

118. Cease, K.B., and J.A. Berzofsky. 1988. Antigenic structures recognized by T cells: Toward the rational design of an AIDS vaccine. *AIDS* 2:(suppl.1) S95-S101.

119. Berzofsky, J.A., S.J. Brett, H.Z. Streicher, and H. Takahashi. 1988. Antigen processing for presentation to T lymphocytes: Function, mechanisms, and implications for the T-cell repertoire. *Immunol. Rev.* 106: 5-31.

120. Good, M.F., L.H. Miller, S. Kumar, I.A. Quakyi, D. Keister, J. Adams, B. Moss, J.A. Berzofsky, and R. Carter. 1988. Limited immunological recognition of critical malaria vaccine candidate antigens. *Science* 242: 574-577.

121. Berzofsky, J.A., and I.J. Berkower. 1989. Immunogenicity and antigen structure. In *Fundamental Immunology* 2nd Edition. W.E. Paul, editor. Raven Press, New York, pp. 169-208.

122. Berzofsky, J.A., S.L. Epstein, and I.J. Berkower. 1989. Antigen-antibody interactions and monoclonal antibodies. In *Fundamental Immunology* 2nd edition. W.E. Paul, editor. Raven Press, New York, pp. 315-356.

123. Dontfraid, F., M.A. Cochran, D. Pombo, J.D. Knell, I. Quakyi, S. Kumar, R.A. Houghten, J.A. Berzofsky, L.H. Miller, and M.F. Good. 1988. Human and murine CD4 T-cell epitopes map to the same region of the malaria circumsporozoite protein: Limited

immunogenicity of sporozoites and cirumsporozoite protein. *Mol. Biol. Med.* , 5: 185-196.

124. Hosmalin, A.M., P.L. Nara, M. Zweig, K.B. Cease, E. Gard, P.D. Markham, S.D. Putney, M.D. Daniel, R.C. Desrosiers, and J.A. Berzofsky. 1989. Enhancement of an antibody response to the envelope glycoprotein of HIV-1 in primates by priming with helper T-cell epitope peptides. In *Vaccines 89*. R. Lerner, H. Ginsberg, R. Chanock, and F. Brown, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, 121-124

125. Takahashi, H., J. Cohen, A. Hosmalin, K.B. Cease, R. Houghten, J.L. Cornette, C. Delisi, S. Merli, B. Moss, R.N. Germain, and J.A. Berzofsky. 1989. Limited epitope repertoire recognized with class I MHC molecules by murine cytotoxic lymphocytes on the HIV gp160 envelope glycoprotein. In *Vaccines 89*. R. Lerner, H. Ginsberg, R. Chanock, and F. Brown, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor., 109-114.

126. Berzofsky, J.A. 1989. Immunodominance of T-cell epitopes: Applications to vaccine design. In *Vaccines 89*. R. Lerner, H. Ginsberg, R. Chanock, and F. Brown, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, 27-31.

127. Berzofsky, J.A. 1988. The structural basis of antigen recognition by T lymphocytes: Implications for vaccines. *J. Clin. Invest.* 82: 1811-1817.

128. Berzofsky, J.A. 1989. Mechanisms of immunodominance in T-cell recognition, with applications to vaccine design. In *Immune System and Cancer: Proceedings of the Nineteenth International Symposium of the Princess Takamatsu Cancer Research Fund.* T. Hamaoka, R.J. Hodes, G. Klein, T. Sugimura, S. Takayama, and Y.Yamamura, editors. The Princess Takamatsu Cancer Research Fund, Tokyo, 161-177.

129. Takahashi, H., K.B. Cease, and J. A. Berzofsky. 1989. Identification of proteases that process distinct epitopes on the same protein. *J. Immunol.* 142: 2221-2229.

130. Brett, S. J., D. McKean, J. York-Jolley, and J. A. Berzofsky. 1989. Antigen presentation to specific T cells by Ia molecules selectively altered by site-directed mutagenesis. *Internat. Immunol.* 1: 130-140.

131. Berzofsky, J. A., and Y. Paterson. 1990. Discussion summary: Antigen structure: B cell and T cell determinants and immunogenicity. In *Immunogenicity (UCLA Symposia on Molecular and Cellular Biology, New Series, Vol. 113)*. C. Janeway, J. Sprent, and E. Sercarz, editors. Alan R. Liss, New York, pp. 65-67.

132. Hoffman, S. L., J. A. Berzofsky, D. Isenbarger, E. Zeltzer, W. R. Majarian, M. Gross, and W. R. Ballou. 1989. Immune response gene regulation of immunity to *Plasmodium berghei* sporozoites and circumsporozoite protein vaccines: Overcoming genetic restriction with whole organism and subunit vaccines. *J. Immunol.* 142: 3581-3584.

133. Cornette, J. L., H. Margalit, C. DeLisi, and J. A. Berzofsky. 1989. Concepts and methods in the identification of T cell epitopes and their use in the construction of synthetic vaccines. *Methods in Enzymol.* 178: 611-634.

134. Sanui, H., T. M. Redmond, S. Kotake, B. Wiggert, L.-H. Hu, H. Margalit, J. A. Berzofsky, G. J. Chader, and I. Gery. 1989. Identification of an immunodominant and highly immunopathogenic determinant in the retinal interphotoreceptor retinoid-binding protein (IRBP). *J. Exp. Med.* 169: 1947-1960.

135. DeGroot, A. S., A. H. Johnson, W. L. Maloy, I. A. Quakyi, E. M. Riley, A. Menon, S. M. Banks, J. A. Berzofsky, and M. F. Good. 1989. Human T cell recognition of polymorphic epitopes from malaria circumsporozoite protein. *J. Immunol.* 142: 4000-4005.

136. Palker, T. J., T. J. Matthews, A. Langlois, M. E. Tanner, M. E. Martin, R.M. Scearce, J. E. Kim, J. A. Berzofsky, D. P. Bolognesi, and B. F. Haynes. 1989. Polyvalent human immunodeficiency virus synthetic immunogen comprised of envelope gp120 T helper cell sites and B cell neutralization epitopes. *J. Immunol.* 142: 3612-3619.

137. Sanza, L. R., L.M.Gierasch, J. A. Berzofsky, G. K. Buckenmeyer, K. B. Cease, and C. S. Ouyang. 1988. Formation of amphipathic secondary structure is correlated to T-cell antigenicity in a series of synthetic peptides from sperm whale myoglobin. In *Peptides: Chemistry and Biology*. G. R. Marshall, editor, ESCOM, Leiden, pp. 549-550.

138. Palker, T. J., T. J. Matthews, A. Langlois, J. E. Kim, J. A. Berzofsky, D. P. Bolognesi, and B. F. Haynes. 1989. Multivalent synthetic peptide inoculum induces neutralizing antibodies to divergent HIV isolates and anamnestic T-cell responses to HIV gp120. In *Early Human Retroviruses*. J. E. Groopman, I. Chen, M. Essex, and R. Weiss, editors. Alan R. Liss, New York, in press.

139. Clerici, M., N. I. Stocks, R. A. Zajac, R. N. Boswell, D. C. Bernstein, D. L. Mann, G. M. Shearer, and J. A. Berzofsky. 1989. IL-2 production used to detect antigenic peptide recognition by T helper lymphocytes from asymptomatic, HIV seropositive individuals. *Nature* 339: 383-385.

140. Williams, W.V., S.D. London, D.B. Weiner, S. Wadsworth, J.A. Berzofsky, F. Robey, D.H. Rubin, and M.I. Greene. 1989. Immune response to a molecularly defined internal image idiotope. *J. Immunol.* 142: 4392-4400.

141. Brett, S.J., K.B. Cease, C.S. Ouyang, and J.A. Berzofsky. 1989. Fine specificity of T cell recognition of the same peptide in association with different I-A molecules. *J. Immunol.* 143: 771-779.

142. Hale, P.M., K.B. Cease, R.A. Houghten, C. Ouyang, S. Putney, K. Javaherian, H. Margalit, J.L. Cornette, J.L. Spouge, C. Delisi, and J.A. Berzofsky. 1989. T cell multideterminant regions in the human immunodeficiency virus envelope: toward overcoming the problem of major histocompatibility complex restriction. *Internat. Immunol.* 1: 409-415.

143. Berzofsky, J.A., A. Kurata, H. Takahashi, S.J. Brett, and D.J. McKean. 1989. Molecular studies of antigen processing and presentation to T cells by class II MHC molecules. In Cold Spring Harbor Symposium on Quantitative Biology LIV: Immunological Recognition. J.D. Watson, and J. R. Inglis, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, pp. 417-430.

144. Kurata, A., T.J. Palker, R.D. Streilein, R.M. Scearce, B.F. Haynes, and J.A. Berzofsky. 1989. Immunodominant sites of human T-cell lymphotropic virus type 1 envelope protein for murine helper T cells. *J. Immunol.* 143: 2024-2030.

145. Redmond, T.M., H. Sanui, L.H. Hu, B. Wiggert, H. Margalit, J.A. Berzofsky, G.J. Chader, and I. Gery. 1989. Immune responses to peptides derived from the retinal protein IRBP: immunopathogenic determinants are not necessarily immunodominant. *Clinical Immunology and Immunopathology* 53: 212-224.

146. Lark, L.R., J.A. Berzofsky, and L.M. Gierasch. 1989. T-Cell antigenic peptides from sperm whale myoglobin fold as amphipathic helices: a possible determinant for immunodominance?. *Peptide Research* : 2: 314-321.

147. Vacchio, M.S., J.A. Berzofsky, U. Krzych, J.A. Smith, R.J. Hodes, and A. Finnegan. 1989. Sequences outside a minimal immunodominant site exert negative effects on recognition by staphylococcal nuclease-specific T-cell clones. *J. Immunol.* 143: 2814-2819.

148. Vajda, S., H. Margalit, R. Kataoka, J. L. Cornette, J. A. Berzofsky, and C. DeLisi. 1990. Molecular structure and vaccine design. *Ann. Rev. Biophys. Biophys. Chem.*. 19: 69-82..

149. Takahashi, H., S. Merli, S.D. Putney, R. Houghten, B. Moss, R.N. Germain, and J.A. Berzofsky. 1989. A single amino acid interchange yields reciprocal CTL specificities for HIV gp160. *Science* 246: 118-121.

150. Takahashi, H., R. Houghten, S.D. Putney, D.H. Margulies, B. Moss, R.N. Germain, and J.A. Berzofsky. 1989. Structural requirements for class-I MHC molecule-mediated antigen presentation and cytotoxic T-cell recognition of an immunodominant determinant of the HIV envelope protein. *J. Exp. Med.* 170: 2023-2035.

151. Weiss, W.R., M.F. Good, M.R. Hollingdale, L.H. Miller, and J.A. Berzofsky. 1989. Genetic control of immunity to *Plasmodium yoelii* sporozoites. *J. Immunol.* 143: 4263-4266.

152. Berzofsky, J.A., P.M. Hale, M. Clerici, K.B. Cease, R.A. Houghten, S.D. Putney, R.A. Zajac, R.N. Boswell, H. Margalit, J.L. Cornette, J.L. Spouge, C. Delisi, and G.M. Shearer. 1990. Multideterminant regions of the HIV-1 envelope with sites seen by murine and human helper T cells: circumventing the MHC restriction problem. In *Vaccines 90.* F. Brown, R.M. Chanock, H.S. Ginsberg, and R.A. Lerner, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, pp. 307-312.

153. Takahashi, H., R. Houghten, S. Merli, S.D. Putney, B. Moss, R.N. Germain, and J.A. Berzofsky. 1990. Immunoodominant CTL epitope of HIV-1 envelope protein: the relationship between viral mutation and CTL specificity. In *Vaccines 90*. F. Brown, R.M. Chanock, H.S. Ginsberg, and R.A. Lerner, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, pp 269-276.

154. Vinetz, J.M., S. Kumar, M.F. Good, B.J. Fowlkes, J.A. Berzofsky, and L.H. Miller. 1990. Adoptive transfer of CD8+ T cells from immune animals does not transfer immunity to blood stage *Plasmodium yoelii* malaria. *J. Immunol.* 144: 1069-1074.

155. Takahashi, H., R.N. Germain, B. Moss, and J.A. Berzofsky. 1990. An immunodominant class I-restricted CTL determinant of HIV-1 induces CD4 class II-restricted help for itself. *J. Exp. Med.* 171: 571-576.

156. Weiss, W.R., S. Mellouk, R.A. Houghten, M. Sedegah, S. Kumar, M.F. Good, J.A. Berzofsky, L.H. Miller, and S.L. Hoffman. 1990. Cytotoxic T cells recognize a peptide from the circumsporozoite protein on malaria infected hepatocytes. *J. Exp. Med.* 171: 763-773.

157. Kotake, S., B. Wiggert, T.M. Redmond, D.E. Borst, J.M. Nickerson, H. Margalit, J.A. Berzofsky, G.J. Chader, and I. Gery. 1990. Repeated determinants within the retinal interphotoreceptor retinoid-binding protein (IRBP). Immunological properties of the repeats of an immunodominant determinant. *Cellular Immunol.*, 126: 331-342.

158. Hosmalin, A., M. Clerici, R. Houghten, C.D. Pendleton, C. Flexner, D.R. Lucey, B. Moss, R.N. Germain, G.M. Shearer, and J.A. Berzofsky. 1990. An epitope in HIV-1 reverse transcriptase recognized by both mouse and human CTL. *Proc. Natl. Acad. Sci. U. S. A.* 87: 2344-2348.

159. Ahlers, J., M. Clerici, A. Hosmalin, G.M. Shearer, and J.A. Berzofsky. 1990. Host immune response: T helper cell responses. In *Techniques in HIV Research*. A. Aldovini, and B. Walker, editors. Stockton Press, New York, pp. 211-222.

160. Berzofsky, J.A. 1990. Immunogenicity of antigens recognized by T cells. In *Cellular Immunity and the Immunotherapy of Cancer*. M.T. Lotze, and O.J. Finn, editors. Wiley-Liss, Inc., New York, 1-22.

161. Takahashi, H., T. Takeshita, B. Morein, S.D. Putney, R.N. Germain, and J.A. Berzofsky. 1990. Induction of specific $CD8^+$ class I-MHC restricted CTL against HIV envelope protein by immunization with purified whole protein in ISCOMs. *Nature* , 344: 873-875.

162. Kim, J.E., M. Kojima, R. Houghten, C.D. Pendleton, J.L. Cornette, C. Delisi, and J.A. Berzofsky. 1990. Characterization of a helper T-cell epitope recognized by mice of a low responder major histocompatibility type. *Molec. Immunol.* 27: 941-946.

163. Weiner, D.B., W.V. William, M.J. Merva, K. Huebner, J.A. Berzofsky, and M.I. Greene. 1990. HIV Infectivity analysis of viral envelope determinants and target cell requirements

for infectivity by HIV-1. In *Vaccines 90*. F. Brown, R.M. Chanock, H.S. Ginsberg, and R.A. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. 339-345.

164. Kurata, A., and J.A. Berzofsky. 1990. Analysis of peptide residues interacting with MHC molecule or T-cell receptor: can a peptide bind in more than one way to the same MHC molecule?. *J. Immunol.* 144: 4526-4535.

165. Kumar, S., J. Gorden, J.L. Flynn, J.A. Berzofsky, and L.H. Miller. 1990. Immunization of mice against *Plasmodium vinckei* with a combination of attenuated *Salmonella typhimurium* and malarial antigen. *Infect. Immun.* 58: 3425-3429.

166. Kozlowski, S., T. Takeshita, W. -H. Boehncke, H. Takahashi, L. F. Boyd, R. N. Germain, J. A. Berzofsky, and D. H. Margulies. 1991. Excess β_2-microglobulin promotes functional peptide association with purified soluble class I MHC molecules. *Nature* 349: 74-77.

167. Hosmalin, A., P. L. Nara, M. Zweig, N. W. Lerche, K. B. Cease, E. A. Gard, P. D. Markham, S. D. Putney, M. D. Daniel, R. C. Desrosiers, and J. A. Berzofsky. 1991. Priming with helper T-cell epitope peptides enhances the antibody response to the envelope glycoprotein of HIV 1 in primates. *J. Immunol.* 146: 1667-1673.

168. Berzofsky, J.A. 1991. Progress towards an artificial vaccine for HIV: identification of helper and cytotoxic T-cell epitopes and methods of immunization. *Biotech. Therapeutics.* 2: 123-135.

169. Berzofsky, J.A. 1991. Approaches and issues in the development of vaccines against HIV. *J. Acq. Immune Defic. Syndromes* 4: 451-459.

170. Clerici, M., D. R. Lucey, R. A. Zajac, R. N. Boswell, H. M. Gebel, H. Takahashi, J. A. Berzofsky, and G. M. Shearer. 1991. Detection of cytotoxic T lymphocytes specfic for synthetic peptides of gp160 in HIV-seropositive individuals. *J. Immunol.* 146: 2214-2219.

171. Culver, K.W., C. Able, R. Toper, S. Freeman, J. A. Berzofsky, and R. M. Blaese. 1990. Lymphocytes as vehicles for gene therapy. In *Cellular Immunity and the Immunotherapy of Cancer*. M.T. Lotze and O.J. Finn, editors. Wiley-Liss, Inc., New York. 129-137.

172. Clerici, M., C. O. Tacket, C. S. Via, D. R. Lucey, S. C. Muluk, R. A. Zajac, R. N. Boswell, J. A. Berzofsky, and G. M. Shearer. 1991. Immunization with subunit human immunodeficiency virus vaccine generates stronger T helper cell immunity than natural infection. *Eur. J. Immunol.* 21: 1345-1349.

173. Takahashi, H., T. Takeshita, B. Moreln, S. Putney, R. N. Germain, and J. A. Berzofsky. 1991. A unique subunit immunogen, ISCOM-gp160, can elicit MHC class-I-restricted HIV envelope-specific $CD8^+$CTLs. In *Vaccines 91*. R.M. Chanock, H.S. Ginsberg, F. Brown, and R.A. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. 1-7.

174. Lipham, W.J., T. M. Redmond, H. Takahashi, J. A. Berzofsky, B. Wiggert, G. J. Chader, and I. Gery. 1991. Recognition of peptides that are immunopathogenic but cryptic: Mechanisms that allow lymphocytes sensitized against cryptic peptides to initiate pathogenic autoimmune processes. *J. Immunol.* 146: 3757-3762.

175. Clerici, M., J. A. Berzofsky, G. M. Shearer, and C. O. Tacket. 1991. Exposure to HIV-1 indicated by HIV-specific T helper cell responses before detection of infection by polymerase chain reaction and serum antibodies. *J. Infect. Dis.* 164: 178-182.

176. Berzofsky, J.A. 1991. Mechanisms of T cell recognition with application to vaccine design. *Molec. Immunol.* 28:217-223.

177. Berzofsky, J.A. 1991. Development of artificial vaccines against HIV using defined epitopes. *FASEB J.* 5: 2412-2418.

178. Berzofsky, J.A. 1991. Antigenic peptide interaction with MHC molecules: implications for the design of artificial vaccines. *Seminars in Immunology* 3: 203-216.

179. Goodman-Snitkoff, G., M. F. Good, J. A. Berzofsky, and R. J. Mannino. 1991. Role of intrastructural/intermolecular help in immunization with peptide-phospholipid complexes. *J. Immunol.* 147: 410-415.

180. Berzofsky, J.A., C. D. Pendleton, M. Clerici, J. Ahlers, D. R. Lucey, S. D. Putney, and G. M. Shearer. 1991. Construction of peptides encompassing multideterminant clusters of human immunodeficiency virus envelope to induce in vitro T-cell responses in mice and humans of multiple MHC types. *J. Clin. Invest.* 88: 876-884.

181. Berzofsky, J.A. 1991. Human immunodeficiency virus: structural features of T-cell epitopes and their use in vaccine development. In Viruses and the Cellular Immune Response. D.B. Thomas, editor. Marcel Dekker,Inc., New York.

182. Berzofsky, J.A., C. D. Pendleton, M. Clerici, J. Ahlers, D. R. Lucey, S. D. Putney, and G. M. Shearer. 1991. Peptides containing multideterminant clusters of Human Immunodeficiency Virus envelope induce murine and human T -cell responses in diverse histocompatibilty types. *Transac. Assoc. Amer. Phys.* 104: 69-77.

183. Ida, H., A. Kurata, K. Eguchi, A. Kawakami, K. Migita, T. Fukuda, T. Nakamura, Y. Kusumoto, J. A. Berzofsky, and S. Nagataki. 1991. Different B-cell responses to human T-cell lymphotrophic virus type I (HTLV-I) envelope synthetic peptides in HTLV-I-infected individuals. *Journal of Clinical Immunology* 11:143-151.

184. DeGroot, A. S., M. Clerici, A. Hosmalin, S. H. Hughes, D. Barnd, C. W. Hendrix, R. A. Houghten, G. M. Shearer, and J. A. Berzofsky. 1991. Human immunodeficiency virus (HIV-1) reverse transcriptase T helper epitopes identified in mice and humans: Correlation with a cytotoxic T cell (CTL) epitope. *J. Infect. Dis.* 164: 1058-1065.

185. Takahashi, H., Y. Nakagawa, C. D. Pendleton, R. A. Houghten, K. Yokomuro, R. N. Germain, and J. A. Berzofsky. 1992. Analysis of CTL crossreactivity to an HIV-1 immunodominant determinant: elicitation of widely crossreactive CTL. In *Vaccines 92*. F. Brown, R. Chanock, H. Ginsberg, and R. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. 69-74.

186. Shirai, M. and J. A. Berzofsky. 1992. Promiscuity of cytotoxic T-cell epitopes from the HIV-1 envelope . In *Vaccines 92*. F. Brown, R. Chanock, H. Ginsberg, and R. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. 243-246.

187. Berzofsky, J. A. 1992. Progress towards artificial vaccines for HIV. In *Vaccines 92*. F. Brown, R. Chanock, H. Ginsberg, and R. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. 41-50.

188. Takahashi, H., Y. Nakagawa, C. D. Pendleton, R. A. Houghten, K. Yokomuro, R. N. Germain, and J. A. Berzofsky. 1992. Induction of broadly crossreactive cytotoxic T cells recognizing an HIV-1 envelope determinant. *Science* , 255: 333-336.

189. Shirai, M., C. D. Pendleton, and J. A. Berzofsky. 1992. Broad recognition of cytotoxic T-cell epitopes from the HIV-1 envelope protein with multiple class I histocompatibility molecules. *J. Immunol.* 148: 1657-1667.

190. Cornette, J. L., H. Margalit, C. DeLisi, and J. A. Berzofsky. 1993. The amphipathic helix as a structural feature involved in T-cell recognition. In The Amphipathic Helix. R.M. Epand, editor. CRC Press, Boca Raton., 333-346.

191. Clerici, M., J. V. Giorgi, C. -C. Chou, V. K. Gudeman, J. A. Zack, P. Gupta, H. -N. Ho, P. G. Nishanian, J. A. Berzofsky, and G. M. Shearer. 1992. Cell mediated immune response to human immunodeficiency virus type I (HIV-1) in seronegative homosexual men with recent sexual exposure to HIV-1. *J. Infect. Dis.* 165: 1012-1019.

192. Kozlowski, S., M. Corr, T. Takeshita, L. F. Boyd, C. D. Pendleton, R. N. Germain, J. A. Berzofsky, and D. H. Margulies. 1992. Serum angiotensin-1 converting enzyme activity processes an HIV 1 gp160 peptide for presentation by MHC class I molecules. *J. Exp. Med.* 175: 1417-1422.

193. Kullberg, M. C., E. J. Pearce, S. E. Hieny, A. Sher, and J. A. Berzofsky. 1992. Infection with *Schistosoma mansoni* alters Th1/Th2 cytokine responses to a non-parasite antigen. *J. Immunol.* 148: 3264-3270.

194. Sher, A., R. T. Gazzinelli, I. P. Oswald, M. Clerici, M. Kullberg, E. J. Pearce, J. A. Berzofsky, T. R. Mosmann, S. L. James, H. C. Morse,III, and G. M. Shearer. 1992. Role of T-cell derived cytokines in the downregulation of immune responses in parasitic and retroviral infection. *Immunological Reviews* 127: 183-204.

195. Shirai, M., T. Akatsuka, C. D. Pendleton, R. Houghten, C. Wychowski, K. Mihalik, S. Feinstone, and J. A. Berzofsky. 1992. Induction of cytotoxic T cells to a crossreactive

epitope in the hepatitis C viral nonstructural RNA polymerase-like protein. *J. Virol.* 66: 4098-4106.

196. Clerici, M., J. A. Berzofsky, G. M. Shearer, J. V. Giorgi, and C. Tacket. 1992. On HIV-serologic testing of blood and tissue donors. *New Engl. J. Med.* 327: 564-565 (letter).

197. Quakyi, I. A., D. W. Taylor, A. H. Johnson, J. B. Allotey, J. A. Berzofsky, L. H. Miller, and M. F. Good. 1992. Development of a malaria T-cell vaccine for blood stage immunity. *Scand. J. Immunol.* 36 (Suppl. 11):9-16.

198. Hosmalin, A., S. Kumar, D. Barnd, R. Houghten, G. E. Smith, S. H. Hughes, and J. A. Berzofsky. 1992. Immunization with soluble protein-pulsed spleen cells induces class I-restricted CTL that recognize immunodominant epitopic peptides from *P. falciparum* and HIV-1. *J. Immunol.* 149: 1311-1318.

199. Weiss, W. R., J. A. Berzofsky, R. A. Houghten, M. Sedegah, M. Hollindale, and S. L. Hoffman. 1992. A T cell clone directed at the circumsporozoite protein which protects mice against both *Plasmodium yoelii* and *Plasmodium berghei.* *J. Immunol.* 149: 2103-2109.

200. Actor, J. K., M. Shirai, M. C. Kullberg, R. M. L. Buller, A. Sher, and J. A. Berzofsky. 1993. Helminth infection results in decreased virus-specific $CD8^+$ cytotoxic T-cell and Th1 cytokine responses as well as delayed virus clearance. *Proc. Natl. Acad. Sci. USA* 90: 948-952.

201. Boehncke, W. -H., T. Takeshita, C. D. Pendleton, S. Sadegh-Nasseri, L. Racioppi, R. A. Houghten, J. A. Berzofsky, and R. N. Germain. 1993. The importance of dominant negative effects of amino acids side chain substitution in peptide-MHC molecule interactions and T cell recognition. *J. Immunol.* 150: 331-341.

202. Takahashi, H., Y. Nakagawa, M. Takeuchi, K. Yokomuro, and J. A. Berzofsky. 1993. Elicitation of $CD8^+$ class-I-restricted CTLs by immunization with syngeneic irradiated HIV-1 envelope-derived peptide-pulsed splenic dendritic cells. In *Vaccines 93.* F. Brown, R.M. Chanock, H.S. Ginsberg, and R.A. Lerner, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor.

203. Berzofsky, J. A. and I. J. Berkower. 1993. Immunogenicity and antigen structure. In *Fundamental Immunology.* 3rd Edn. W.E. Paul, editor. Raven Press, New York., pp. 235-282.

204. Berzofsky, J. A., I. J. Berkower, and S. L. Epstein. 1993. Antigen-antibody interactions and monoclonal antibodies. In *Fundamental Immunology.* 3rd Edn. W.E. Paul, editor. Raven Press, New York. , pp. 421-465.

205. Berzofsky, J. A. 1995. Immunogenicity and Antigenicity. In *Samter's Immunological Diseases* . M.M. Frank, K.F. Austen, H.N. Claman, and E.R. Unanue, editors. Little, Brown, and Company, Boston, pp. 17-32..

206. Berzofsky, J. A. 1993. Epitope selection and design of synthetic vaccines: molecular approaches to enhancing immunogenicity and crossreactivity of engineered vaccines. *Annals of the New York Academy of Sciences* , 690: 256-264.

207. Ahlers, J. D., C. D. Pendleton, N. Dunlop, A. Minassian, P. L. Nara, and J. A. Berzofsky. 1993. Construction of an HIV-1 peptide vaccine containing a multideterminant helper peptide linked to a V3 loop peptide 18 inducing strong neutralizing antibody responses in mice of multiple MHC haplotypes following two immunizations. *J. Immunol.* 150: 5647-5665.

208. Wasserman, G. M., S. Kumar, J. Ahlers, F. Ramsdell, J. A. Berzofsky, and L. H. Miller. 1993. An approach to development of specfic T lymphocyte lines using preprocessed antigens in murine malaria *Plasmodium vinckei vinckei. Infect. Immun.* 61: 1958-1963.

209. Takahashi, H., Y. Nakagawa, K. Yokomuro, and J. A. Berzofsky. 1993. Induction of $CD8^+$ CTL by immunization with syngeneic irradiated HIV-1 envelope derived peptide-pulsed dendritic cells. *Internat. Immunol.* 5: 849-857.

210. Shirai, M., M. S. Vacchio, R. J. Hodes, and J. A. Berzofsky. 1993. Preferential Vβ usage by cytotoxic T cells crossreactive between two epitopes of HIV-1 gp160 and degenerate in class I MHC restriction. *J. Immunol.* 151: 2283-2295.

211. Yanuck, M., D. P. Carbone, C. D. Pendleton, T. Tsukui, S. F. Winter, J. D. Minna, and J. A. Berzofsky. 1993. A mutant p53 tumor suppressor protein is a target for peptide-induced $CD8^+$ cytotoxic T cells. *Cancer. Res.* 53: 3257-3261.

212. Takeshita, T., S. Kozlowski, R. D. England, R. Brower, J. Schneck, H. Takahashi, C. DeLisi, D. H. Margulies, and J. A. Berzofsky. 1993. Role of conserved regions of class I MHC molecules in the activation of $CD8^+$ CTL by peptide and purified cell-free class I molecules. *Internat. Immunol.* 5: 1129-1138.

213. Kozlowski, S., M. Corr, M. Shirai, L. F. Boyd, C. D. Pendleton, J. A. Berzofsky, and D. H. Margulies. 1993. Multiple pathways are involved in the extracellular processing of major histocompatibility complex class I-restricted peptides. *J. Immunol.* 151: 4033-4044.

214. Williams, M. E., M. C. Kullberg, S. Barbieri, P. Caspar, J. A. Berzofsky, R. A. Seder, and A. Sher. 1993. $Fc\varepsilon R^+$ cells are a major source of antigen induced IL-4 in spleens of mice infected with *Schistosoma mansoni* . *Eur. J. Immunol.* 23: 1910-1916.

215. Shirai, M., C. D. Pendleton, J. Ahlers, T. Takeshita, M. Newman, and J. A. Berzofsky. 1994. Helper-CTL determinant linkage required for priming of anti-HIV $CD8^+$ CTL in vivo with peptide vaccine constructs. *J. Immunol.* 152: 549-556.

216. Clerici, M., A. V. Sison, J. A. Berzofsky, T. A. Rakusan, C. D. Brandt, M. Ellaurie, M. Villa, C. Colie, D. J. Venzon, J. L. Sever, and G. M. Shearer. 1993. Cellular immune factors associated with mother-to-infant transmission of HIV. *AIDS* 7:1427-1433.

217. Clerici, M., D. R. Lucey, J. A. Berzofsky, L. A. Pinto, T. A. Wynn, S. P. Blatt, M. J. Dolan, C. W. Hendrix, S. F. Wolf, and G. M. Shearer. 1993. Restoration of HIV-specific cell-mediated immune responses by interleukin-12 *in vitro*. *Science* 262: 1721-1724.

218. Clerici, M., T. A. Wynn, J. A. Berzofsky, S. P. Blatt, C. W. Hendrix, A. Sher, R. L. Coffman, and G. M. Shearer. 1994. Role of interleukin-10 (IL-10) in T helper cell dysfunction in asymptomatic individuals infected with the human immunodeficiency virus (HIV-1). *J. Clin. Invest.* 93: 768-775.

219. Cease, K. B. and J. A. Berzofsky. 1994. Towards a vaccine for AIDS: the emergence of immunobiology-based vaccine development. *Annu. Rev. Immunol.* 12: 923-989.

220. Altuvia, Y., J. A. Berzofsky, R. Rosenfeld, and H. Margalit. 1994. Sequence features that correlate with MHC restriction . *Molec. Immunol.* 31: 1-19.

221. Berzofsky, J. A., J. D. Ahlers, M. Shirai, C. D. Pendleton, T. Takeshita, N. Dunlop, A. Minassian, M. Newman, and P. L. Nara. 1994. Construction of candidate synthetic peptide vaccines for HIV-1. In Vaccines 94: Modern approaches to new vaccines including prevention of AIDS. E. Norrby, F. Brown, R.M. Chanock, and H.S. Ginsberg, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. pp. 147-153.

222. Takahashi, H., T. Takeshita, S. Kozlowski, Y. Nakagawa, J. Ahlers, C. D. Pendleton, R. L. Moore, B. S. Fox, K. Yokomuro, D. H. Margulies, and J. A. Berzofsky. 1994. An immunodominant determinant of HIV-1 envelope recognized by both class-I-restricted $CD8^+$ CTLs and class II-restricted $CD4^+$ helper T cells shares similar MHC-binding sites. In Vaccines 94: Modern approaches to new vaccines including prevention of AIDS. E. Norrby, F. Brown, R.M. Chanock, and H.S. Ginsberg, editors. Cold Spring Harbor Laboratory Press, Cold Spring Harbor. pp. 181-188.

223. Clerici, M., J. M. Levin, H. A. Kessler, A. Harris, J. A. Berzofsky, A. L. Landay, and G. M. Shearer. 1994. HIV-specific T-helper activity in seronegative health care workers exposed to contaminated blood. *J. Amer. Med. Assoc.* 271:42-46.

224. Clerici, M. and J. A. Berzofsky. 1994. Cellular immunity and cytokines in HIV infection . *AIDS* 8: S175-S182.

225. Wiedenfeld, E. A., M. Fernandez-Viña, J. A. Berzofsky, and D. P. Carbone. 1994. Evidence for selection against human lung cancers bearing p53 missense mutations which occur within the HLA A *0201 peptide consensus motif . *Cancer Res.* 54:1175-1177.

226. Weissler, J. C., L. E. Rosenberg, and J. A. Berzofsky. 1994. The spring meetings: Back to the future. *J. Clin. Invest.* 93:457-458.

227. Shirai, M., H. Okada, M. Nishioka, T. Akatsuka, C. Wychowski, R. Houghten, C. D. Pendleton, S. M. Feinstone, and J. A. Berzofsky. 1994. An epitope in hepatitis C virus core region recognized by cytotoxic T cells in mice and humans. *J. Virol.* 68:3334-3342.

228. Kozhich, A. T., Y. -I. Kawano, C. E. Egwuagu, R. R. Caspi, R. K. Maturi, J. A. Berzofsky, and I. Gery. 1994. A pathogenic autoimmune process targeted at a surrogate epitope. *J. Exp. Med.* 180: 133-140.

229. Bermas, B. L., M. Petri, J. A. Berzofsky, A. Waisman, G. M. Shearer, and E. Mozes. 1994. Autoantibodies in mice with experimentally induced systemic lupus erythematosus (SLE) and patients with SLE bind gp120 and peptides from the HIV-1 envelope. *AIDS Res. Hum. Retroviruses.* 10: 1071-1077.

230. Berzofsky, J. A. 1994. Presidential address to the American Society for Clinical Investigation, Baltimore, Maryland, 30 April, 1994: Cross-fertilization among fields: a seminal event in the progress of biomedical research. *J. Clin. Invest.* 94: 911-918.

231. Brower, R. C., R. England, T. Takeshita, S. Kozlowski, D. H. Margulies, J. A. Berzofsky, and C. DeLisi. 1994. Minimal requirements for peptide mediated activation of $CD8^+$ CTL. *Molec. Immunol.* 31: 1285-1293.

232. Quakyi, I. A., J. Currier, A. Fell, D. W. Taylor, T. Roberts, R. A. Houghten, R. D. England, J. A. Berzofsky, L. H. Miller, and M. F. □ Good. 1994. Analysis of human T cell clones specific for conserved peptide sequences within malaria proteins: paucity of clones responsive to intact parasites. *J. Immunol.* 153: 2082-2092.

233. Nishimura, M., A. G. Kermode, M. Clerici, G. M. Shearer, J. A. Berzofsky, T. Uchiyama, S. Z. Wiktor, E. Pate, B. Maloney, A. Manns, W. Blattner, and S. Jacobson. 1994. Demonstration of human T lymphotropic virus type (HTLV-I)-specific T cell responses from seronegative and polymerase chain reaction-negative persons exposed to HTLV-I. *J. Infect. Dis.* 170:334-338.

234. Actor, J. K., M. A. Marshall, I. A. Eltoum, R. M. L. Buller, J. A. Berzofsky, and A. Sher. 1994. Increased susceptibility of mice infected with *Schistosoma mansoni* to recombinant vaccinia virus: association of viral persistence with egg granuloma formation. *Eur. J. Immunol.* 24: 3050-3056.

235. Meister, G. E., C. G. P. Roberts, J. A. Berzofsky, and A. S. DeGroot. 1995. Two novel T cell epitope prediction algorithms based on MHC-binding motifs; comparison of predicted and published epitopes from *Mycobacterium tuberculosis* and HIV protein sequences. *Vaccine* , 13: 581-591.

236. Takeshita, T., H. Takahashi, S. Kozlowski, J. D. Ahlers, C. D. Pendleton, R. L. Moore, Y. Nakagawa, K. Yokomuro, B. S. Fox, D. H. Margulies, and J. A. Berzofsky. 1995. Molecular analysis of the same HIV peptide functionally binding to both a class I and a class II MHC molecule. *J. Immunol.* 154: 1973-1986.

237. Berzofsky, J. A., J. D. Ahlers, M. Alexander-Miller, T. Tsukui, C. D. Pendleton, N. Dunlop, D. P. Carbone, and P. L. Nara. 1995. Developing synthetic peptide vaccines for HIV-1. In Molecular approaches to the control of infectious deseases. F. Brown, R. Chanock, H.S. Ginsberg, and E. Norrby, editors. Cold Spring Harbor Laboratory, Cold Spring Harbor, 135-142.

238. Berzofsky, J. A. and I. J. Berkower. 1995. Novel approaches to peptide and engineered protein vaccines for HIV using defined epitopes: advances in 1994-95. *AIDS* 9: S143-157.

239. Shirai, M., T. Arichi, M. Nishioka, T. Nomura, K. Ikeda, K. Kawanishi, V. H. Engelhard, S. M. Feinstone, and J. A. Berzofsky. 1995. Cytotoxic T lymphocyte (CTL) responses of HLA-A2.1-transgenic mice specific for hepatitis C viral peptides predict epitopes for CTL of humans carrying HLA-A2.1. *J. Immunol.* 154: 2733-2742.

240. Battegay, M., J. Fikes, A. M. Di Bisceglie, P. A. Wentworth, A. Sette, E. Celis, W. -M. Ching, A. Grakoui, C. M. Rice, K. Kurokohchi, J. A. Berzofsky, J. H. Hoofnagle, S. M. Feinstone, and T. Akatsuka. 1995. Patients with chronic hepatitis C have circulating cytotoxic T cells which recognize hepatitis C virus□-encoded peptides binding to HLA-A2.1 molecules. *J. Virol.* 69:2462-2470.

241. Berzofsky, J. A. 1995. Designing peptide vaccines to broaden recognition and enhance potency. *Ann. N. Y. Acad. Sci.* 754: 161-168.

242. Malik, A., R. Houghten, G. Corradin, S. Buus, J. A. Berzofsky, and S. L. Hoffman. 1995. Identification of a nonameric H-2K^{k}-restricted CD8^{+} cytotoxic lymphocyte epitope on the *Plasmodium falciparum* circumsporozoite protein. *Infect. Immun.* 63: 1955-1959.

243. Pinto, L. A., J. Sullivan, J. A. Berzofsky, M. Clerici, H. A. Kessler, A. L. Landay, and G. M. Shearer. 1995. *Env*-specific cytotoxic T lymphocyte responses in HIV seronegative health care workers occupationally exposed to HIV-contaminated body fluids. *J. Clin. Invest.* 96: 867-876.

244. Cornette, J. L., H. Margalit, J. A. Berzofsky, and C. DeLisi. 1995. Periodic variation in side chain polarities of T cell antigenic peptides correlates with their structure and activity. *Proc. Nat. Acad. Sci. USA.* 92: 8368-8372.

245. England, R. E., M. C. Kullberg, J. L. Cornette, and J. A. Berzofsky. 1995. Molecular analysis of a heteroclitic T-cell response to the immunodominant epitope of sperm whale myoglobin: implications for peptide partial agonists. *J. Immunol.* 155: 4295-4306.

246. Shirai, M., M. Chen, T. Arichi, M. Nishioka, M. Newman, T. Nakazawa, S. M. Feinstone, and J. A. Berzofsky. 1996. Use of intrinsic and extrinsic helper epitopes for in vivo induction of anti-hepatitis C virus cytotoxic T lymphocytes (CTL) with CTL epitope peptide vaccines. *J. Infect. Dis.* 173: 24-31.

247. Shearer, G. M., M. Clerici, A. Sarin, J. A. Berzofsky, and P. A. Henkart. 1995. Cytokines in immune regulation/pathogenesis in HIV infection. Ciba Foundation Symposium 195: 142-153 (Wiley, Chichester).

248. Seder, R. A., K. H. Grabstein, J. A. Berzofsky, and J. F. McDyer. 1995. Cytokine interactions in human immunodeficiency virus-infected individuals: Roles of interleukin (IL)-2, IL-12, and IL-15. *J. Exp. Med.* 182:1067-1078.

249. Kurokohchi, K., T. Akatsuka, C. D. Pendleton, A. Takamizawa, M. Nishioka, M. Battegay, S. M. Feinstone, and J. A. Berzofsky. 1996. Use of recombinant protein to identify a motif-negative human CTL epitope presented by HLA-A2 in the hepatitis C virus NS3 region. *J. Virol.* 70: 232-240.

250. Takahashi, H., Y. Nakagawa, G. Leggatt, Y. Ishida, T. Saito, K. Yokomuro, and J. A. Berzofsky. 1996. Inactivation of HIV-1 envelope-specific CD8+ cytotoxic T lymphocytes by free antigenic peptide: A self-veto mechanism? *J. Exp. Med.* 183: 879-889.

251. Ahlers, J. D., N. Dunlop, C. D. Pendleton, M. Newman, P. L. Nara, and J. A. Berzofsky. 1996. Candidate HIV-1 multideterminant cluster peptide-P18MN vaccine constructs elicit Th1 helper T cells, cytotoxic T cells, and neutralizing antibody, all using the same adjuvant immunization. *AIDS Res. Hum. Retroviruses* 12: 259-272.

252. Kurokohchi, K., M. Carrington, D. L. Mann, T. B. Simonis, S. M. Feinstone, T. Akatsuka, and J. A. Berzofsky. 1996. Expression of HLA class I molecules and the transporter associated with antigen preocessing (TAP) in hepatocellular carcinoma. *Hepatology* 23: 1181-1188.

253. Kullberg, M. C., J. A. Berzofsky, D. Lj. Jankovic, S. Barbieri, M. E. Williams, P. Perlmann, A. Sher, and M. Troye-Blomberg. 1996. T-cell-derived IL-3 induces the production of IL-4 by non-B, non-T cells to amplify the Th2-cytokine response to a non-parasite antigen in *Schistosoma mansoni*-infected mice. *J. Immunol.* 156: 1482-1489.

254. Quakyi, I. A., L. H. Miller, M. F. Good, J. D. Ahlers, S. N. Isaacs, J. H. Nunberg, R. A. Houghten, D. B. Keister, J. E. Coligan, B. Moss, D. Alling, J. A. Berzofsky, and D. C. Kaslow. 1995. Synthetic Peptides from *P. falciparum* sexual stage 25-kDa protein induce antibodies that react with the native protein: the role of IL-2 and conformational structure on immunogenicity of Pfs25. *Peptide Research* 8: 335-344.

255. Ciernik, I. F., J. A. Berzofsky, and D. P. Carbone. 1995. Mutant oncopeptide immunization induces CTL specifically lysing tumor cells endogenously expressing the corresponding intact mutant p53. *Hybridoma* 14:139-142.

256. Alexander-Miller, M. A., K. C. Parker, T. Tsukui, C. D. Pendleton, J. E. Coligan, and J. A. Berzofsky. 1996. Molecular analysis of presentation by HLA-A2.1 of a promiscuously binding V3 loop peptide from the HIV-1 envelope protein to human CTL. *Int. Immunol.* 8: 641-649.

257. Alexander-Miller, M. A., G. R. Leggatt, and J. A. Berzofsky. 1996. Selective expansion of high or low avidity cytotoxic T lymphocytes and efficacy for adoptive immunotherapy. *Proc. Natl. Acad. Sci. U. S. A.* 93: 4102-4107.

258. Roberts, C. G. P., G. E. Meister, B. T. Jesdale, J. Lieberman, J. A. Berzofsky, and A. S. DeGroot. 1996. Prediction of HIV peptide epitopes by a novel algorithm. *AIDS Res. Hum. Retroviruses* 12: 593-610.

259. Landay, A. L., M. Clerici, F. Hashemi, H. Kessler, J. A. Berzofsky, and G. M. Shearer. 1996. In vitro restoration of T cell immune function in human immunodeficiency virus-positive persons: effects of interleukin (IL)-12 and anti-IL-10. *J. Infect. Dis.* 173: 1085-1091.

260. Ciernik, I. F., J. A. Berzofsky, and D. P. Carbone. 1996. Human lung cancer cells endogenously expressing mutant p53 process and present the mutant epitope, and are lysed by mutant-specific CTL. *Clin. Cancer. Res.* 2: 877-882..

261. Ciernik, I. F., J. A. Berzofsky, and D. P. Carbone. 1996. Induction of cytotoxic T lymphocytes and anti-tumor immunity with DNA vaccines expressing single T cell epitopes. *J. Immunol.* 156: 2369-2375.

262. Gabrilovich, D. I., S. Nadaf, J. Corak, J. A. Berzofsky, and D. P. Carbone. 1996. Dendritic cells in anti-tumor immune reponses. II. Dendritic cells grown from bone marrow precursors, but not mature DC from tumor-bearing mice are effective antigen carriers in the therapy of established tumors.. *Cellular Immunol.* 170: 111-119.

263. Clerici, M., A. Sarin, J. A. Berzofsky, A. L. Landay, H. A. Kessler, F. Hashemi, C. W. Hendrix, S. P. Blatt, J. Rusnak, M. J. Dolan, R. L. Coffman, P. A. Henkart, and G. M. Shearer. 1996. Antigen-stimulated apoptotic T cell death in HIV infection is selective for $CD4^+$ T cells, modulated by cytokines and effected by lymphotoxin. *AIDS* 10: 603-611.

264. Tian, J. -H., L. H. Miller, D. C. Kaslow, J. Ahlers, M. F. Good, D. W. Alling, J. A. Berzofsky, and S. Kumar. 1996. Genetic regulation of protective immune response in congenic strains of mice vaccinated with a subunit malaria vaccine. *J. Immunol.* 157: 1176-1183.

265. Alexander-Miller, M. A., G. R. Leggatt, A. Sarin, and J. A. Berzofsky. 1996. Role of antigen, CD8, and CTL avidity in high dose antigen induction of apoptosis of effector CTL. *J. Exp. Med.* 184: 485-492.

266. Tsukui, T., A. Hildesheim, M. H. Schiffman, J. Lucci III, D. Contois, P. Lawler, B. B. Rush, A. T. Lorincz, A. Corrigan, R. D. Burk, W. Qu, M. A. Marshall, D. Mann, M. Carrington, M. Clerici, G. M. Shearer, D. P. Carbone, D. R. Scott, R. A. Houghten, and J. A. Berzofsky. 1996. IL-2 production in vitro by peripheral lymphocytes in response to human papillomavirus-derived peptides: correlation with cervical pathology. *Cancer Res.* 56: 3967-3974.

267. Huang, X., M. C. Smith, J. A. Berzofsky, and J. J. Jr. Barchi. 1996. Structural comparison of a 15 residue peptide from the V3 loop of HIV-1_{IIIB} and an O-glycosylated analogue. *FEBS Letters* 393: 280-286.

268. Shirai, M., K. Kurokohchi, C. D. Pendleton, T. Arichi, L. F. Boyd, H. Takahashi, D. H. Margulies, and J. A. Berzofsky. 1996. Reciprocal CTL cross-reactivity interactions between two major epitopes within HIV-1 gp160. *J. Immunol.* , 157: 4399-4411.

269. Beretta, A., S. H. Weiss, G. Rappocciolo, R. Mayur, D. De Santis, J. Quirinale, A. Cosma, P. Robbioni, G. M. Shearer, J. A. Berzofsky, M. L. Villa, A. Siccardi, and M. Clerici. 1996. Human immunodeficiency virus type 1 (HIV-1)-seronegative injection drug users at risk for HIV exposure have antibodies to HLA class I antigens and T cells specific for HIV envelope. *J. Infect. Dis.* 173: 472-476.

270. Pinto, L. A., A. L. Landay, J. A. Berzofsky, H. A. Kessler, and G. M. Shearer. 1997. Immune response to human immunodeficiency virus (HIV) in healthcare workers occupationally exposed to HIV-contaminated blood. Am. J. Med. 102 (5B): 21-24.

271. Leggatt, G. R., M. A. Alexander-Miller, A. Kumar (née Malik), S. L. Hoffman, and J. A. Berzofsky. 1997. Cytotoxic T lymphocyte (CTL) adherence assay (CAA): A non-radioactive assay for murine CTL recognition of peptide-MHC class I complexes. *J. Immunol. Methods*, 201: 1-10.

272. Sarin, A., M. S. Williams, M. A. Alexander-Miller, J. A. Berzofsky, C. M. Zacharchuk, and P. A. Henkart. 1997. Target cell lysis by CTL granule exocytosis is independent of ICE/Ced-3 family proteases. *Immunity* 6: 209-215.

273. Saito, T., G. J. Sherman, K. Kurokohchi, Z. -P. Guo, M. Donets, M. -Y. W. Yu, J. A. Berzofsky, T. Akatsuka, and S. M. Feinstone. 1997. Plasmid DNA-based immunization for hepatitis C virus structural proteins, immune responses in mice. *Gastroenterology* 112: 1321-1330.

274. Shirai, M., S. Kozlowski, D. H. Margulies, and J. A. Berzofsky. 1997. Degenerate MHC restriction reveals the contribution of class I MHC molecules in determining the fine specificity of CTL recognition of an immunodominant determinant of HIV-1 gp160 V3 loop. *J. Immunol.* 158: 3181-3188.

275. Ahlers, J. D., N. Dunlop, D. W. Alling, P. L. Nara, and J. A. Berzofsky. 1997. Cytokine-in-adjuvant steering of the immune response phenotype to HIV-1 vaccine constructs: GM-CSF and TNFα synergize with IL-12 to enhance induction of CTL. *J. Immunol.* 158: 3947-3958.

276. Kozhich, A. T., R. R. Caspi, J. A. Berzofsky, and I. Gery. 1997. Immunogenicity and immunopathogenicity of an autoimmune epitope are potentiated by increasing MHC binding through residue substitution. *J. Immunol.* 158: 4145-4151.

277. Zhang, C., J. L. Cornette, J. A. Berzofsky, and C. DeLisi. 1997. The organization of human leukocyte antigen class I epitopes in HIV genome products: Implications for HIV evolution and vaccine design. *Vaccine* 15: 1291-1302.

278. Smith, M. C., C. D. Pendleton, V. E. Maher, M. J. Kelley, D. P. Carbone, and J. A. Berzofsky. 1997. Oncogenic mutations in ras create HLA-A2.1 binding peptides but affect their extracellular processing. *Internat. Immunol.* 9: 1085-1093.

279. Goletz, T. J., K. R. Klimpel, S. H. Leppla, J. M. Keith, and J. A. Berzofsky. 1997. Delivery of antigens to the MHC class I pathway using bacterial toxins. *Hum. Immunol.* 54: 129-136..

280. DeGroot, A. S., B. M. Jesdale, and J. A. Berzofsky. 1998. Prediction and determination of MHC ligands and T cell epitopes. In Immunological Methods in Microbiology Vol. 25. Immunology of Infection. S.H.E. Kaufmann and D. Kabelitz, editors. Academic Press, London, Chap. 3, pp. 79-106.

281. Hirunpetcharat, C., J. -H. Tian, D. C. Kaslow, N. van Rooijen, S. Kumar, J. A. Berzofsky, L. H. Miller, and M. F. Good. 1997. Complete protective immunity induced in mice by immunization with the 19kDa carboxyterminal fragment of the merozoite surface protein-1 ($MSP1_{19}$) of *Plasmodium yoelii* expressed in *Saccharomyces cerevisiae*: Correlation of protection with antigen-specific antibody titer, but not effector $CD4^+$ T cells. *J. Immunol.* 159: 3400-3411.

282. DeGroot, A. S., G. E. Meister, J. L. Cornette, H. Margalit, C. DeLisi, and J. A. Berzofsky. 1997. Computer prediction of T-cell epitopes. In New Generation Vaccines. M.M. Levine, G.C. Woodrow, J.B. Kaper, and G.S. Cobon, editors. Marcel Dekker, Inc., New York. 127-138.

283. Ahlers, J. D., T. Takeshita, C. D. Pendleton, and J. A. Berzofsky. 1997. Enhanced immunogenicity of HIV-1 vaccine construct by modification of the native peptide sequence. *Proc. Natl. Acad. Sci. U. S. A.* 94: 10856-10861.

284. Shirai, M., T. Arichi, T. Nakazawa, and J. A. Berzofsky. 1998. Persistent infection by Helicobacter pylori downmodulates virus-specific $CD8^+$ cytotoxic T cell response and prolongs viral infection. *J. Infect. Dis.* 177: 72-80.

285. Goletz, T.J., K. R. Klimpel, N. Arora, S. H. Leppla, J. M. Keith, and J. A. Berzofsky. 1997. Targeting HIV proteins to the major histocompatibility complex class I processing pathway with a novel gp120-anthrax toxin fusion protein. *Proc. Natl. Acad. Sci. U.S.A.* 94: 12059-12064.

286. Belyakov, I. M., M. A. Derby, J. D. Ahlers, B. L. Kelsall, P. Earl, B. Moss, W. Strober, and J. A. Berzofsky. 1998. Mucosal immunization with HIV-1 peptide vaccine induces mucosal and systemic cytotoxic T lymphocytes and protective immunity in mice against intrarectal recombinant HIV-vaccinia challenge. *Proc. Natl. Acad. Sci.* 95:1709-1714.

287. Hildesheim, A., M. H. Schiffman, T. Tsukui, C. A. Swanson, J. Lucci, D. R. Scott, A. G. Glass, B. B. Rush, A. T. Lorincz, A. Corrigan, R. D. Burk, K. Helgesen, R. A. Houghten, M. E. Sherman, R. J. Kurman, J. A. Berzofsky, and T. R. Kramer. 1997. Immune activation in cervical neoplasia: Cross-sectional association between plasma soluble interleukin 2 receptor levels and disease. *Cancer Epidemiol. Biomark. Preven.* 6:807-813.

288. Leggatt, G. R. and J. A. Berzofsky. 1999. Cytotoxic T cell adherence assay (CAA). In *Methods in Molecular Biology Series : T cell protocols*. K. Kearse, editor. Humana Press, Totowa, NJ.,134: 277-281.

289. Belyakov, I. M., L. S. Wyatt, J. D. Ahlers, P. Earl, C. D. Pendleton, B. L. Kelsall, W. Strober, B. Moss, and J. A. Berzofsky. 1998. Induction of mucosal CTL response by intrarectal immunization with a replication-deficient recombinant vaccinia virus expressing HIV 89.6 envelope protein. *J. Virol.* 72: 8264-8272.

290. Leggatt, G. R., A. Hosmalin, C. D. Pendleton, A. Kumar, S. Hoffman, and J. A. Berzofsky. 1998. The importance of pairwise interactions between peptide residues in the delineation of T cell receptor specificity. *J Immunol.* 161: 4728-4735:

291. Sarobe, P., C. D. Pendleton, T. Akatsuka, D. Lau, V. H. Engelhard, S. M. Feinstone, and J. A. Berzofsky. 1998. Enhanced in vitro potency and in vivo immunogenicity of a CTL epitope from hepatitis C virus core protein following amino acid replacement at secondary HLA-A2.1 binding positions. *J. Clin. Invest.* 102: 1239-1248.

292. Alexander-Miller, M. A., M. A. Derby, A. Sarin, P. A. Henkart, and J. A. Berzofsky. 1998. Supra-optimal peptide/MHC causes a decrease in Bcl-2 and allows TNF-α □receptor II-mediated apoptosis of CTL. *J. Exp. Med.* 188: 1391-1399.

293. Berzofsky, J. A., I. J. Berkower, and S. L. Epstein. 1999. Antigen-antibody interactions and monoclonal antibodies. In *Fundamental Immunology*. W.E. Paul, editor. Lippincott-Raven, Philadelphia. 75-110.

294. Berzofsky, J. A. and I. J. Berkower. 1999. Immunogenicity and antigen structure. In *Fundamental Immunology*. W.E. Paul, editor. Lippincott-Raven, Philadelphia. 651-699.

295. Goletz, T. J., C. L. Mackall, J. A. Berzofsky, and L. J. Helman. 1998. Molecular alterations in pediatric sarcomas: potential targets for immunotherapy. *Sarcoma* 2:77-87.

296. Tian, J.-H., M. F. Good, C. Hirunpetcharat, S. Kumar, I. T. Ling, D. Jackson, J. Cooper, J. Lukszo, J. Coligan, J. Ahlers, A. Saul, J. A. Berzofsky, A. A. Holder, L. H. Miller, and D. C. Kaslow. 1998. Definition of T cell epitopes within the 19kDa carboxyterminal fragment *Plasmodium yoelii* merozoite surface protein 1 ($MSP1_{19}$) and their role in immunity malaria. *Parasite Immunol.* 20: 263-278.

297. Shirai, M., T. Arichi, M. Chen, M. Nishioka, K. Ikeda, H. Takahashi, N. Enomoto, T. Saito, M. E. Major, T. Nakazawa, T. Akatsuka, S. M. Feinstone, and J. A. Berzofsky. 1999. T cell recognition of hypervariable region 1 from hepatitis C virus envelope protein with

multiple class II MHC molecules in mice and humans: Preferential help for induction of antibodies to the hypervariable region.. *J. Immunol.* 162: 568-576.

298. Oscherwitz, J., F. M. Gotch, K. B. Cease, and J. A. Berzofsky. 1999. New insights and approaches regarding B and T cell epitopes in HIV vaccine design. *AIDS* , 13 (Suppl. A): S163-S174.

299. Suh, W-K., M. A. Derby, M. F. Cohen-Doyle, G. J. Schoenhals, K. Früh, J. A. Berzofsky, and D. B. Williams. 1999. Interaction of murine MHC class I molecules with tapasin and TAP enhances peptide loading and involves the heavy chain α3 domain. *J. Immunol.* 162: 1530-1540.

300. Belyakov, I. M., J. D. Ahlers, B. Y. Brandwein, P. Earl, B. L. Kelsall, B. Moss, W. Strober, and J. A. Berzofsky. 1998. The importance of local mucosal HIV-specific $CD8^+$ cytotoxic T lymphocytes for resistance to mucosal-viral transmission in mice and enhancement of resistance by local administration of IL-12. *J. Clin. Invest.* 102: 2072-2081.

301. D'Amico, R., L. A. Pinto, P. Meyer, A. L. Landay, A. A. Harris, M. Clerici, J. A. Berzofsky, G. M. Shearer, and H. A. Kessler. 1999. Effect of zidovudine postexposure prophylaxis on the department of HIV-specific cytotoxic T-lymphocyte responses in HIV-exposed health care workers. *Infection Control and Hospital Epidemiology* , 20: 428-430.

302. McDyer, J. F., M. Dybul, T. J. Goletz, A. L. Kinter, E. K. Thomas, J. A. Berzofsky, A. S. Fauci, and R. A. Seder. 1999. Differential effects of CD40 ligand/trimer stimulation on the ability of dendritic cells to replicate and transmit HIV infection: Evidence for CC-chemokine-dependent and -independent mechanisms. *J. Immunol.* , 162: 3711-3717.

303. Belyakov, I. M., B. Moss, W. Strober, and J. A. Berzofsky. 1999. Mucosal vaccination overcomes the barrier to recombinant vaccinia immunization caused by preexisting poxvirus immunity. *Proc. Natl. Acad. Sci. U. S. A.* 96: 4512-4517.

304. Berzofsky, J. A., J. D. Ahlers, M. A. Derby, C. D. Pendleton, T. Arichi, and I. M. Belyakov. 1999. Approaches to improve engineered vaccines for HIV and other viruses that cause chronic infections. *Immunological Reviews* 170: 151-172.

305. Matsui, S., J. D. Ahlers, A. O. Vortmeyer, M. Terabe, T. Tsukui, D. P. Carbone, L. A. Liotta, and J. Berzofsky. 1999. A model for $CD8^+$ CTL tumor immunosurveillance and regulation of tumor escape by $CD4^+$ T cells through an effect on quality of CTL. *J. Immunol.* 163: 184-193.

306. Maher, V. E., B. S. Worley, D. Contois, M. C. Smith, M. J. Kelley, M. Stipanov, S. N. Khleif, T. Goletz, L. van den Broeke, C. Mackall, L. J. Helman, D. P. Carbone, and J. A. Berzofsky. 2000. Mutant oncogene and tumor suppressor gene products and fusion proteins created by chromosomal translocations as targets for cancer vaccines. In *Peptide-based cancer vaccines*. W.M. Kast, editor. Landes Bioscience, Austin, pp. 17-39.

307. Chung, D. H., J. Dorfman, D. Plaksin, K. Natarajan, I. M. Belyakov, R. Hunziker, J. A. Berzofsky, W. M. Yokoyama, M. G. Mage, and D. H. Margulies. 1999. Natural killer (NK) and cytolytic T lymphocyte (CTL) recognition of a single chain H-2D^d molecule: distinct sites of H-2D^d interact with NK and T cell receptors. *J. Immunol.* 163: 3699-3708.

308. Pinto, L. A., J. A. Berzofsky, K. R. Fowke, R. F. Littles, F. Merced-Galindez, R. Humphreys, J. Ahlers, N. Dunlop, R. B. Cohen, S. M. Steinberg, P. Nara, G. M. Shearer, and R. Yarchoan. 1999. HIV-specific immunity following immunization with HIV synthetic envelope peptides in asymptomatic HIV-infected patients. *AIDS* 13: 2003-2012.

309. Berzofsky, J. A., L. J. Helman, and D. P. Carbone. 2000. Oncogene products and mutated proteins as tumor antigens. In *Biologic Therapy of Cancer: Principles and Practice* (3rd Ed.). S. A. Rosenberg, editor. Lippincott Williams & Wilkins, Philadelphia, 526-540.

310. Arichi, T., T. Saito, M. E. Major, I. M. Belyakov, M. Shirai, V. H. Engelhard, S. M. Feinstone, and J. A. Berzofsky. 2000. Prophylactic DNA vaccine for hepatitis C virus (HCV) infection: HCV specific CTL induction and protection from HCV-recombinant vaccinia infection in an HLA-A2.1 transgenic mouse model. *Proc. Natl. Acad. Sci. U.S.A.* 97: 297-302. (Retracted due to discovery of fraud by first author.)

311. Ciernik, I. F., P. Romero, J. A. Berzofsky, and D. P. Carbone. 1999. Ionizing radiation enhances immunogenicity of cells expressing a tumor-specific T-cell epitope. *Int. J. Rad. Oncolo. Biol. Phys.* 45:735-741.

312. Parra, M., G. Hui, A. Johnson, J. A. Berzofsky, T. Roberts, I. A. Quakyi, and D. W. Taylor. 2000. Characterization of conserved T and B cell epitopes in Plasmodium falciparum major merozoite surface protein-1 (MSP-1). *Infect. Immun.* 68: 2685-2691.

313. Berzofsky, J. A. 2000. Immunogenicity and Antigenicity. In *Samter's Immunologic Diseases* Sixth Edition. K.F. Austen, M.M. Frank, J.P. Atkinson, and H. Cantor, editors. Lippincott Williams & Wilkins, Baltimore, Chap. 7, pp. 65-82.

314. Berzofsky J.A., J.D. Ahlers, I.M. Belyakov. 2002. Design of Engineered Vaccines for HIV. In: Wong-Staal F, Gallo RC, editors. *AIDS Vaccine Research.* New York: Marcel Dekker, Inc. 173-206..

315. Nakagawa Y, T. Takeshita, J.A. Berzofsky, H. Takahashi. 2000. Analysis of mechanism for extracellular processing in the presentation of HIV-1 envelope protein derived peptide to epitope-specific CTL. *Immunology.* 101: 76-82..

316. Grene E, D.A. Newton, E.A. Brown, J.A. Berzofsky, S. Gattoni-Celli, G.M. Shearer. 2000. Semi-allogeneic cell hybrids stimulate HIV-1 envelope-specific cytotoxic T lymphcytes. AIDS: 14: 1497-1506.

317. Polakova, K., D. Plaksin, D.H. Chung, I.M. Belyakov, J.A. Berzofsky, and D.H. Margulies, 2000. Antibodies directed against the MHC-I molecule H-2D^d complexed with an antigenic peptide: similarities to a T cell receptor with the same specificity. *J. Immunol.* 165: 5703-5712.

318. Belyakov, I.M., J.D. Ahlers, J.D. Clements, W. Strober, and J.A. Berzofsky, 2000. Interplay of cytokines and adjuvants in the regulation of mucosal and systemic HIV-specific cytotoxic T lymphocytes. *J. Immunol.* 165: 6454-6462.

319. Terabe, M., S. Matsui, N. Noben-Trauth, H. Chen, C. Watson, D. D. Donaldson, D. P. Carbone, W. E. Paul, and J. A. Berzofsky. 2000. NKT cell-mediated repression of tumour immunosurveillance by IL-13 and the IL-4R-STAT6 pathway. *Nature Immunology* 1: 515-520.

320. Takahashi, M., Y. Nakagawa, J. A. Berzofsky, and H. Takahashi. 2001. Counter-regulation of cytolytic activity and cytokine production in human immunodeficiency virus (HIV)-1-specific murine CD8$^+$ cytotoxic T lymphocytes by free antigenic peptide. *Int Immunol.* 13: 43-51.

321. Mackall, C., J. Berzofsky, and L. J. Helman. 2000. Targeting tumor specific translocations in sarcomas in pediatric patients for immunotherapy. *Clin. Orthopaedics and Related Research* 373: 25-31.

322. Derby, M. A., M. A. Alexander-Miller, R. Tse, and J. A. Berzofsky. 2001. High avidity CTL exploit two complementary mechanisms to provide better protection against viral infection than low avidity CTL. *J. Immunol.*, 166: 1690-1697.

323. Shirai, M., R. Fujinaga, T. Masaki, and J. A. Berzofsky. 2001. Impaired development of HIV-1 gp160-specific CD8$^+$ cytotoxic T cells by a delayed switch from Th1 to Th2 cytokine phenotype in mice with *Helicobacter pylori* infection. *Eur. J. Immunol.*, 31: 516-526.

324. Simon, R. M., S. M. Steinberg, M. Hamilton, A. Hildesheim, S. Khleif, L. W. Kwak, C. L. Mackall, J. Schlom, S. L. Topalian, and J. A. Berzofsky. 2001. Clinical trial designs for the early clinical development of therapeutic cancer vaccines. *J. Clin. Oncol.* 19: 1848-1854.

325. McGettigan, J. P., H. D. Foley, I. M. Belyakov, J. A. Berzofsky, R. J. Pomerantz, and M. J. Schnell. 2001. Rabies virus-based vectors expressing HIV-1 envelope protein induce a strong, cross-reactive cytotoxic T-lymphocyte response against envelop proteins from different HIV-1 isolates. *J. Virol.* 75: 4430-4434.

326. Derby, M.A., J. Wang, D. H. Margulies, and J. A. Berzofsky. 2001. Two intermediate avidity CTL clones with a disparity between functional avidity and MHC tetramer staining. *Internat. Immunol.* 13: 817-824.

327. Ahlers, J. D., I. M. Belyakov, S. Matsui, and J. A. Berzofsky. 2001. Mechanisms of cytokine synergy essential for vaccine protection against viral challenge. *Internat. Immunol.*13: 897-908.

328. Wong, E. C. C., V. E. Maher, K. Hines, J. Lee, C. S. Carter, T. Goletz, W. Kopp, C. L. Mackall, J. A. Berzofsky, and E. J. Read. 2001. Development of a clinical-scale method for generation of dendritic cells from peripheral blood monocytes for use in cancer immunotherapy. *Cytotherapy* 3: 19-29.

329. Chung, D. H., I. M. Belyakov, M. A. Derby, J. Wang, L. F. Boyd, J. A. Berzofsky, and D. H. Margulies. 2001. Competitive inhibition *in vivo* and skewing of the T cell repertoire of antigen-specific CTL priming by an anti-peptide-MHC mAb. *J. Immunol.* 167: 699-707.

330. Horner, A. A., S. K. Datta, K. Takabayashi, I. M. Belyakov, T. Hayashi, N. Cinman, M.-D. Nguyen, J. H. Van Uden, J. A Berzofsky, D D. Richman, and E. Raz. 2001. Immunostimulatory DNA-based vaccines elicit multifaceted immune responses against HIV at systemic and mucosal sites. *J. Immunol.*,167: 1584-1591.

331. Ahlers, J. D., I. M. Belyakov, S. Matsui, and J. A. Berzofsky. 2001. Signals delivered through TCR instruct IL-12R expression: IL-12 and TNFα synergize for IL-12R expression at low antigen dose. *Internat. Immunol.* 13: 1433-1442.

332. Derby, M. A., J. T. Snyder, R. Tse, M. A. Alexander-Miller, and J. A. Berzofsky. 2001. An abrupt and concordant initiation of apoptosis: antigen-dependent death of $CD8^+$ CTL. *Eur. J. Immunol.* 31: 2951-2959.

333. Worley, B. S., L. T. van den Broeke, T. J. Goletz, C. D. Pendleton, E. M. Daschbach, E. K. Thomas, F. M. Marincola, L. J. Helman, and J. A. Berzofsky. 2001. Antigenicity of fusion proteins from sarcoma-associated chromosomal translocations. *Cancer Research* 61: 6868-6875.

334. Hel, Z., J. Nacsa, B. Kelsall, W.-P. Tsai, N. Letvin, R. W. Parks, E. Tryniszewska, L. Picker, M. G. Lewis, Y. Edghill-Smith, M. Moniuszko, R. Pal, L. Stevceva, J. D. Altman, T. M. Allen, D. Watkins, J. V. Torres, J. A. Berzofsky, I. M. Belyakov, W. Strober, and G. Franchini. 2001. Impairment of gag-specific $CD8^+$ T-cell function in mucosal and systemic compartments of SIV_{mac251}- and $SHIV_{ku2}$- infected macaques. *J. Virol.*, 75: 11483-11495.

335. Marshall, M. A., D. Jankovic, V. E. Maher, A. Sher, and J. A. Berzofsky. 2001. Mice infected with *Schistosoma mansoni* develop a novel non-T lymphocyte suppressor population which inhibits virus-specific CTL induction via a soluble factor. *Microbes and Infection* 3: 1051-1061.

336. Belyakov, I. M., J. Wang , R. Koka, J. D. Ahlers, J. T. Snyder, R. Tse , J. Cox , J. S. Gibbs, D. H. Margulies and J. A. Berzofsky. 2001. Activating CTL precursors to reveal CTL function without skewing the repertoire by in vitro expansion. *Eur. J. Immunol.* 31: 3557-3566.

337. Berzofsky, J. A. 2001. Design of engineered vaccines for systemic and mucosal immunity to HIV. *Pathol. Biol.* 49: 466-467.

338. Dagher, R., L. Long, E.J. Read, S.F. Leitman, C.S. Carter, M. Tsokos, S. Kumar, T.J. Goletz, J.A. Berzofsky, L.J. Helman and C.L. Mackall. 2002. A pilot trial of tumor-specific peptide vaccination and continuous infusion interleukin-2 in patients with recurrent Ewing's sarcoma and alveolar rhabdomyosarcoma: an interinstitute NIH study. *Medical and Pediatric Oncology*, 38: 158-164.

339. Bukreyev, A., I. M. Belyakov, J. A. Berzofsky, B. R. Murphy, and P. L. Collins. 2001. Granulocyte-macrophage colony-stimulating factor expressed by a recombinant respiratory syncytial virus attenuates viral replication and increases the level of pulmonary antigen-presenting cells. *J. Virol.*, 75: 12128-12140.

340. Ahlers, J.D., I. M. Belyakov, E. K. Thomas, and J. A. Berzofsky. 2001. High affinity T-helper epitope induces complementary helper and APC polarization, increased CTL and protection against viral infection. *J. Clin. Invest.* 108: 1677-1685.

341. Belyakov, I. M., Z. Hel, B. Kelsall, V. A. Kuznetsov, J. D.Ahlers, J. Nacsa, D. I. Watkins, T. M. Allen, A. Sette, J. Altman , R. Woodward , P. D. Markham , J. D. Clements , G. Franchini, W. Strober and J. A. Berzofsky. 2001. Mucosal AIDS vaccine reduces disease and viral load in gut reservoir and blood after mucosal infection of macaques. *Nature Medicine* 7: 1320-1326.

342. Berzofsky, J. A., J. D. Ahlers, and I. M. Belyakov. 2001. Strategies for designing and optimizing new generation vaccines. *Nature Reviews Immunology* 1: 209-219.

343. De Groot, A. S., H. Sbai, W. Martin, and J. A. Berzofsky. 2003. Use of bioinformatics to predict MHC ligands and T-cell epitopes: Application to epitope-driven vaccine design. In S. H. E. Kaufmann and D. Kabelitz, editors. *Methods in Microbiology: Immunology of Infection*, 2nd Edition. London: Academic Press. In press.

344. Biragyn, A., I. M. Belyakov, Y. H. Chow, D. S. Dimitrov, J. A. Berzofsky, and L. W. Kwak. 2002. DNA vaccines encoding HIV-1 gp120 fusions with proinflammatory chemoattractants induce systemic and mucosal immune responses. *Blood*, 100: 1153-1159.

345. Mackall, C. L., T. J. Goletz, J. A. Berzofsky, and L. J. Helman. 2002. Toward new approaches: targeting tumor specific molecular alterations with immune based therapy. In C. S. Cooper, editor, *Translocations in Solid Tumors*. Georgetown, TX: Landes Bioscience. In press.

346. Ahlers, J. D., I. M. Belyakov, M. Terabe, R. Koka, D. D. Donaldson, E. K. Thomas, and J. A. Berzofsky. 2002. A push-pull approach to maximize vaccine efficacy: Abrogating suppression with an IL-13 inhibitor while augmenting help with GM-CSF and CD40L. *Proc. Natl. Acad. Sci. USA* 99: 13020-13025.

347. Allen, T.M., P. Jing, B. Calore, H. Horton, D.H. O'Connor, T. Hanke, M. Piekarczyk, R. Ruddersdorf, B.R. Mothe, C. Emerson, N. Wilson, J.D. Lifson, I.M. Belyakov, J.A. Berzofsky, C. Wang, D.B. Allison, D.C. Montefiori, R.C. Desrosiers, S. Wolinsky, K.J. Kunstman, J.D. Altman, A. Sette, A.J. McMichael, and D.I. Watkins. 2002. Effects of Cytotoxic T Lymphocytes (CTL) Directed against a Single Simian Immunodeficiency Virus (SIV) Gag CTL Epitope on the Course of SIVmac239 Infection. *J Virol* 76:10507-10511.

348. Ostrand-Rosenberg, S., V.K. Clements, M. Terabe, J.M. Park, J. Berzofsky, and S.K. Dissanayake. 2002. Resistance to metastatic disease in Stat6-deficient mice requires hematopoietic and non-hematopoietic cells and is IFNγ-dependent. *J. Immunol.* 169: 5796-5804.

349. Berzofsky, J. A., J. D. Ahlers, M. Terabe, and I. M. Belyakov. 2003. Enhancing mucosal and systemic T cell responses and efficacy of HIV/SIV vaccines. In, M. Vicari, B. Dodet, and M. Girard eds., *Retroviruses of Human AIDS and Related Animal Diseases: Proceedings of the XIIIth Cent Gardes Symposium*, Elsevier: Paris, pp. 89-93.

350. Oh, S., J.W. Hodge, J.D. Ahlers, , D.S. Burke, J. Schlom, and J.A. Berzofsky, 2003. Selective induction of high avidity CTL by altering the balance of signals from antigen presenting cells. *J Immunol.* 170: 2523-2530.

351. Takahashi, M., E. Osono, Y. Nakagawa, J. Wang, J. Berzofsky, D.H. Margulies, and H. Takahashi. 2002. Rapid induction of apoptosis in $CD8^+$ HIV-1 envelope-specific murine CTLs by short exposure to antigenic peptide. *J Immunol* 169:6588-6593.

352. Oh, S., J. A. Berzofsky, D. S. Burke, T. A. Waldmann, and L. P. Perera. 2003. Coadministration of HIV vaccine vectors with vaccinia viruses expressing IL-15 but not IL-2 induces long-lasting cellular immunity. *Proc. Natl. Acad. Sci. USA* 100: 3392-3397.

353. Pinto, L.A., J. Edwards, P.E. Castle, C.D. Harro, D.R. Lowy, J.T. Schiller, D. Wallace, W. Kopp, J.W. Adelsberger, M.W. Baseler, J.A. Berzofsky, and A. Hildesheim. 2003. Cellular immune responses to HPV-16 L1 in healthy volunteers immunized with recombinant HPV-16 L1 virus-like particles. *J. Infec. Diseases*, 188: 327-338.

354. Ahlers, J.D., I.M. Belyakov, and J.A. Berzofsky. 2003. Cytokine, chemokine and costimulatory molecule modulation to enhance efficacy of HIV vaccines. *Current Molecular Medicine* 3:85-94.

355. Snyder, J.T., M. A. Alexander-Miller, J. A. Berzofsky, and I. M. Belyakov 2003. Molecular mechanisms and biological significance of CTL avidity. *Current HIV Research* 1: 287-294.

356. Belyakov, I.M., P. Earl, A. Dzutsev, V.A. Kuznetsov, M. Lemon, L.S. Wyatt, J.T. Snyder, J.D. Ahlers, G. Franchini, B. Moss, and J.A. Berzofsky. 2003. Shared modes of protection against poxivirus infection by attenuated and conventional smallpox vaccine viruses. *Proc Natl Acad Sci U S A.*100: 9458-9463.

357. Okazaki, T., D.C. Pendleton, F. Lemonnier, and J.A. Berzofsky. 2003. Epitope-enhanced conserved HIV-1 peptide protects HLA-A2-transgenic mice against virus expressing HIV-1 antigen. *J. Immunol.* 171: 2548-2555.

358. Enghill-Smith, Y., D. Venzon, T. Karpova, J. McNally, J. Nacsa, W.-P. Tsai, E. Tryniszewska, M. Moniuszko, S.J. Snodgrass, J. Parrish, M.G. Lewis, J.A. Berzofsky, I.M. Belyakov, B. Moss, J. Tartaglia, M. Bray, V. Hirsh, H. Golding, and G. Franchini. 2003. Modeling a safer smallpox vaccination regimen, for human immunodeficiency virus type 1-infected patients, in immunocompromised macaques. *J. Infec. Dis.*188: 1181-1191.

359. Terabe, M., J.M. Park, and B. J.A. 2004. Role of IL-13 in negative regulation of anti-tumor immunity. *Cancer Immunol and Immunotherapy*, 53: 79-85.

360. Terabe, M., S. Matsui, J.-M. Park, M. Mamura, N. Noben-Trauth, D.D. Donaldson, W. Chen, S.M. Wahl, S. Ledbetter, B. Pratt, J.J. Letterio, W.E. Paul, and J.A. Berzofsky. 2003. Transforming Growth Factor-β production and myeloid cells are an effector mechanism through which CD1d-restricted T cells block cytotoxic T lymphocyte-mediated tumor immunosurveillance: abrogation prevents tumor recurrence. *J Exp Med* , 198: 1741-1752.

361. van den Broeke, L.T., E.M. Daschbach, E.K. Thomas, G. Andringa, and B. J.A. 2003. Dendritic cell induced activation of adaptive and innate antitumor immunity. *J Immunol.*, 171: 5842-5852.

362. Terabe, M., and Berzofsky, J.A. 2004. Immunoregulatory T cells in tumor immunity. *Current Opinion in Immunology* 16: 157-162.

363. Belyakov, I.M., and J.A. Berzofsky. 2004. Immunobiology of mucosal HIV infection and the basis for development of a new generation of mucosal AIDS vaccines. *Immunity* 20: 247-253.

364. Belyakov, I.M., S.A. Hammond, J.D. Ahlers, G.M. Glenn, and J.A. Berzofsky. 2004. Transcutaneous immunization induces mucosal CTL and protective immunity by migration of primed skin dendritic cells. *Journal of Clinical Investigation* 113: 998-1007.

365. Oh, S., M. Terabe, C.D. Pendleton, A. Bhattacharyy, T.K. Bera, M. Epel, Y. Reiter, J. Phillips, W.M. Linehan, C. Kasten-Sportes, I. Pastan, and J.A. Berzofsky. 2004. Human CTL to wild type and enhanced epitopes of a novel prostate and breast tumor-associated protein, TARP, lyse human breast cancer cells. *Cancer Research* 64: 2610-2618.

366. Berzofsky, J.A., I.J. Berkower, and S.L. Epstein. 2003. Antigen-antibody interactions and monoclonal antibodies. *In* Fundamental Immunology. W.E. Paul, editor. Lippincott Williams & Wilkins, Philadelphia. 69-105.

367. Berzofsky, J.A., and I.J. Berkower. 2003. Immunogenicity and antigen structure. *In* Fundamental Immunology. W.E. Paul, editor. Lippincott Williams & Wilkins, Philadelphia. 631-683.

368. Lee, W.J., K.P. Cantor, J.A. Berzofsky, S.H. Zahm, and A. Blair. 2004. Non-hodgkin's lymphoma among asthmatics exposed to pesticides. *Internat. J. Cancer* 111: 298-302.

369. Snyder, J.T., I.M. Belyakov, A. Dzutsev, F. Lemonnier, and J.A. Berzofsky. 2004. Protection against lethal virus challenge in HLA-A2 transgenic mice by peptide immunization with an HLA-A0201 restricted $CD8^+$ T cell epitope of vaccinia and variola. *Journal of Virology* 78: 7052-7060.

370. Berzofsky, J.A. 2004.New strategies for designing and optimizing vaccines. *American Society for Microbiology News* 70 (5): 219-223.

371. Berzofsky, J.A., and I.M. Belyakov. 2004. Mucosal vaccines to induce cellular immunity against HIV and other viral infections. *In Vaccines*. C.A. de Quadros, editor. Pan American Health Organization, Washington, DC. 223-237.

372. Berzofsky, J.A., M. Terabe, S. Oh, I. M. Belyakov, J. D. Ahlers, J. E. Janik, and J. C. Morris. 2004. Progress on new vaccine strategies for the immunotherapy and prevention of cancer. *J. Clin. Invest.* , 113: 1515-1525.

373. Kuznetsov, V.A., Stepanov, J.A. Berzofsky, and I.M. Belyakov. 2004. Assessment of the relative therapeutic effects of vaccines on virus load and immune responses in small groups at several time points: An efficacy of mucosal and subcutaneous polypeptide vaccines in rhesus macaques exposed to SHIV. *J of Clinical Virology* 31S: S69-S82.

374. Berzofsky, J.A., J. Ahlers, J. Janik, J. Morris, S. Oh, M. Terabe, and I.M. Belyakov. 2004. Progress on new vaccine strategies against chronic viral infections. *J Clin Invest* 114:450-462.

375. Park, J.M., M. Terabe, L.T. van den Broeke, D.D. Donaldson, and J.A. Berzofsky. 2005. Unmasking immunosurveillance against a syngeneic colon cancer by elimination of $CD4^+$ NKT regulatory cells and IL-13. *Internat. J. Cancer* 114: 80-87. (Pub on line Oct. 2004)

376. Belyakov, I.M., J.D. Ahlers, and J.A. Berzofsky. 2004. Mucosal AIDS vaccines: current status and future directions. *Expert Rev. Vaccines* 3:Suppl. 65-73.

377. Sakai, Y., B.J. Morrison, J.D. Burke, J.M. Park, M. Terabe, J.E. Janik, G. Forni, J.A. Berzofsky, and J.C. Morris. 2004. Vaccination by Genetically Modified Dendritic Cells Expressing a Truncated neu Oncogene Prevents Development of Breast Cancer in Transgenic Mice. *Cancer Research* 64: 8022-8028.

378. Oh, S., L.P. Perera, D.S. Burke, T.A. Waldmann, and J.A. Berzofsky. 2004. IL-15/IL-15R alpha-mediated avidity maturation of memory $CD8^+$ T cells. *Proc Natl Acad Sci U S A*, 101: 15154-15159.

379. Pinto, L.A., M.T. Trivett, D. Wallace, J. Higgins, M. Baseler, M. Terabe, I.M. Belyakov,, J.A. Berzofsky, and Allan Hildesheim. 2005. Fixation and Cryopreservation of Whole Blood and Isolated Mononuclear Cells: Influence of Different Procedures on Lymphocyte

Subset Analysis by Flow Cytometry. *Cytometry* Part B (Clinical Cytometry): 63B: 47-55.

380. Zeng, R., R. Spolski, S.E. Finkelstein, S. Oh, P.E. Kovanen, C.S. Hinrichs, C.A. Pise-Masison, M.F. Radonovich, J.N. Brady, N.P. Restifo, J.A. Berzofsky, and W.J. Leonard. 2005. Synergy of IL-21 and IL-15 in Regulating $CD8^+$ T-Cell Expansion and Function. *J Exp Med* 201: 139-148.

381. De Groot, A.S., H. Sbai, W. Martin, J. Sidney, A. Sette, and J.A. Berzofsky. 2004. High-throughput informatics and in vitro assays for T-cell epitope determination: application to the design of epitope-driven vaccines. *In* New Generation Vaccines, Third Edition, Revised and Expanded. M.M. Levine, J.B. Kaper, R. Rappauoli, M.A. Liu, and M.F. Good, editors. Marcel Dekker, Inc., New York. 179-196.

382. Park, J.M., M. Terabe, Y. Sakai, J. Munasinghe, G. Forni, J.C. Morris, and J.A. Berzofsky. 2005. Early Role of CD4+ Th1 cells and antibodies in HER-2 adenovirus-vaccine protection against autochthonous mammary carcinomas. *J Immunol* 174: 4228-4236..

383. De Groot, A.S., and J.A. Berzofsky. 2004. From genome to vaccine--new immunoinformatics tools for vaccine design. *Methods* 34:425-428.

384. Carbone, D.P., I.F. Ciernik, M.J. Kelley, M.C. Smith, S. Nadaf, D. Kavanaugh, V.E. Maher, M. Stipanov, D. Contois, B.E. Johnson, C.D. Pendleton, B. Seifert, C. Carter, E.J. Read, J. Greenblatt, L.E. Top, M.I. Kelsey, J.D. Minna, and J.A. Berzofsky. 2005. Immunization with mutant p53- and K-ras-derived peptides in cancer patients: immune response and clinical outcome. *J. Clin. Oncol.* 23: 5099-5107..

385. Bukreyev, A., I.M. Belyakov, G.A. Prince, K.C. Yim, K.K. Harris, J.A. Berzofsky, and P.L. Collins. 2005. Expression of interleukin-4 by recombinant respiratory syncytial virus is associated with accelerated inflammation and a non-functional cytotoxic T lymphocyte response following primary infection but not following challenge with wild-type virus. *J Virol.* 79: 9515-9526.

386. Dong, Y., J. Qian, R. Ibrahim, J.A. Berzofsky, and S. Khleif. 2005. CTLs alone elicited by peptide vaccine targeting mouse VEGFR2 inhibit angiogenesis and tumor growth. *J. Immunother.* 29: 32-40.

387. Zhang, H., K.S. Chua, M. Guimond, V. Kapoor, M.V. Brown, T.A. Fleisher, L.M. Long, D. Bernstein, B.J. Hill, D.C. Douek, J.A. Berzofsky, C.S. Carter, E.J. Read, L.J. Helman, and C.L. Mackall. 2005. Lymphopenia and interleukin-2 therapy alter homeostasis of CD4(+)CD25(+) regulatory T cells. *Nat Med.*, 11: 1238-1243.

388. van den Broeke, L.T., C.D. Pendleton, C. Mackall, L.J. Helman, and J.A. Berzofsky. 2005. Identification and epitope enhancement of a PAX-FKHR fusion protein breakpoint epitope in alveolar rhabdomyosarcoma cells created by a tumorigenic chromosomal translocation inducing CTL capable of lysing human tumors. *Cancer Research* 66: 1818-1823.

389. Wang, Y.E., C. Zhang, J.A. Berzofsky and C. DeLisi. 2005. Selecting stable molecular targets for treatment and prevention of AIDS. *Genome Informatics* 16: 254-261.

390. Terabe, M., J. Swann, E. Ambrosino, P. Sinha, S. Takaku, Y. Hayakawa, D.I. Godrey, S. Ostrand-Rosenberg, M.J. Smyth, and J.A. Berzofsky. 2005. A nonclassical non-Vα14Jα18 CD1d-restricted (type II) NKT cell is sufficient for down-regulation of tumor immunosurveillance. *J Exp Med* 202:1627-1633.

391. Belyakov, I.M., V.A. Kuznetsov, B. Kelsall, D. Klinman, M. Moniuszko, M. Lemon, P.D. Markham, P. Pal, J.D. Clements, M.G. Lewis, S. Strober, G. Franchini, and J.A. Berzofsky. 2006. Impact of vaccine-induced mucosal high avidity CD8+ CTL in delay of AIDS-viral dissemination from mucosa. *Blood* 107: 3258-3264. (published on-line 2005)

392. Qian, J., Y. Dong, Y.Y. Pang, R. Ibrahim, J. Berzofsky, J.T. Schiller, and S.N. Khleif. 2006. Combined prophylactic and therapeutic cancer vaccine: enhancing CTL responses to HPV16 E2 using a chimeric VLP in HLA-A2 mice. *Internat. J. Cancer*, 118: 3022-3029.

393. Okazaki, T., C. D. Pendleton, P. Sarobe, E. K. Thomas, S. Iyengar, C. Harro, D. Schwartz and J. A. Berzofsky. 2006. Epitope-enhancement of a CD4 HIV epitope toward the development of the next generation HIV vaccine. *J. Immunol.*, 176: 3753-3759.

394. Pal, R., D. Venzon, S. Santra, V.S. Kalyanaraman, D.C. Montefiori, L. Hocker, L. Hudacik, N. Rose, J. Nacsa, E.-S. Y., I.M. Belyakov, J.A. Berzofsky, R. Washington Parks, P. Markham, N.L. Letvin, J. Tartaglia, and G. Franchini. 2006. Systemic Immunization with an ALVAC-HIV-1/Protein Boost Vaccine Strategy Protects Rhesus Macaques from $CD4^+$ T Cell Loss and Reduces Both Systemic and Mucosal SHIVKU2 RNA Levels. *Journal of Virology* 80: 3732-3742.

395. Terabe, M., C. Khanna, S. Bose, F. Melchionda, A. Mendoza, C.L. Mackall, L. Helman, and J.A. Berzofsky. 2006. CD1d-restricted NKT cells can down-regulate tumor immunosurveillance independent of IL-4R-STAT6 or TGF-β. *Cancer Research* 66: 3869-3875.

396. Kawakami, K., M. Terabe, M. Kawakami, J.A. Berzofsky, and R.K. Puri. 2006. Characterization of a novel human tumor antigen IL-13Rα2 chain. *Cancer Research* 66:4434-4442.

397. Kotelkin, A., I.M. Belyakov, L. Yang, J.A. Berzofsky, P.L. Collins, and A. Bukreyev. 2006. The NS2 protein of human respiratory syncytial virus suppresses the cytotoxic T cell response as a consequence of suppressing the type I interferon response. *J Virol* 80: 5958-5967.

398. Kawakami, K., M. Terabe, M. Kioi, J.A. Berzofsky, and R.K. Puri. 2006. Intratumoral Therapy with IL13-PE38 Results in Effective CTL-mediated Suppression of IL-13R alpha 2-Expressing Contralateral Tumors. *Clin Cancer Res* 12: 4678-4686

399. Belyakov, I.M., A. Dzutsev, Q. Zhu, D. Isakov, D. Klinman, and J.A. Berzofsky. 2006. Enhancement of $CD8^+$ T cell immunity in the lung by CpG ODN increases protective efficacy of a Modified Vaccinia Ankara vaccine against lethal poxvirus infection even in CD4-deficient host. *J Immunol* 177: 6336-6343.

400. Okazaki, T., M. Terabe, A.T. Catanzaro, C.D. Pendleton, R. Yarchoan, and J.A. Berzofsky. 2006. Possible therapeutic vaccine strategy against HIV escape from RT inhibitor studied in HLA-A2 transgenic mice. *J Virol* 80: 10645-10651.

401. Oh, S., B. Stegman, C.D. Pendleton, M.O. Ota, C.H. Pan, D.E. Griffin, D.S. Burke, and J.A. Berzofsky. 2006. Protective immunity provided by HLA-A2 epitopes for fusion and hemagglutinin proteins of measles virus. *Virology* 352:390-399.

402. Pinto, L.A., P.E. Castle, R.B. Roden, C.D. Harro, D.R. Lowy, J.T. Schiller, D. Wallace, M. Williams, W. Kopp, I.H. Frazer, J.A. Berzofsky, and A. Hildesheim. 2005. HPV-16 L1 VLP vaccine elicits a broad-spectrum of cytokine responses in whole blood. *Vaccine* 23:3555-3564.

403. Berzofsky, J.A., S. Oh, and M. Terabe. 2005. Peptide vaccines against cancer. *Cancer Treat Res* 123:115-136.

404. Pinto, L.A., R. Viscidi, C.D. Harro, T.J. Kemp, A.J. Garcia-Pineres, M. Trivett, F. Demuth, D.R. Lowy, J.T. Schiller, J.A. Berzofsky, and A. Hildesheim. 2006. Cellular immune responses to HPV-18, -31, and -53 in healthy volunteers immunized with recombinant HPV-16 L1 virus-like particles. *Virology* 353:451-462.

405. Ota, M.O., Z. Ndhlovu, S. Oh, S. Piyasirisilp, J.A. Berzofsky, W.J. Moss, and D.E. Griffin. 2007. The hemagglutinin protein is a primary target of the measles virus-specific HLA-A2-restricted $CD8^+$ T cell response during measles and after vaccination. *J Infect Dis* 195: 1799-1807.

406. Dzutsev, A. H., I. M. Belyakov, D. V. Isakov, D. H. Margulies, and J. A. Berzofsky. 2007. Avidity of CD8 T-cells sharpens immunodominance. *Internat Immunol*, 19: 497-507.

407. Belyakov, I.M., D.V. Isakov, Q. Zhu, A.H. Dzutsev, and J.A. Berzofsky. 2007. A Novel Functional CTL Avidity/Activity Compartmentalization to the Site of Mucosal Immunization Contributes to Protection of Macaques Against SHIV Viral Depletion of Mucosal $CD4^+$ T cells. *J. Immunol.* 178: 7211-7221.

408. Toubaji, A., S. Hill, M. Terabe, J. Qian, T. Floyd, M. Simpson, J.A. Berzofsky, and S.N. Khleif. 2007. The combination of GM-CSF and IL-2 as local adjuvant shows synergy in enhancing peptide vaccines and provides long term tumor protection. *Vaccine* 25: 5882-2891.

409. Perera, P.L., J. Mosca, S. Oh, J.A. Berzofsky, and T.A. Waldmann. 2007. Development of smallpox vaccine candidates with integrated IL-15 that demonstrate superior

immunogenicity, efficacy and safety in mice. *J. Virol.* 81: 8774-8783.

410. Ambrosino, E., M. Terabe, R.C. Halder, J. Peng, S. Takaku, S. Miyake, T. Yamamura, V. Kumer, and J.A. Berzofsky. 2007. Cross-regulation between type I and type II NKT cells in regulating tumor immunity: A new immunoregulatory axis. *J Immunol* 179: 5126-5136.

411. Terabe, M., and J.A. Berzofsky. 2007. NKT cells in immunoregulation of tumor immunity: cross-regulation between two subsets. *Trends in Immunol* , in press.

412. García-Pineres, A.J. A. Hildesheim, R. Herrero, M. Trivett, M. Williams, I. Atmetlla, M. Ramírez, M. Villegas, M. Schiffman, A. C. Rodríguez, R. D. Burk, M. Hildesheim, E. Freer, J. Bonilla, C. Bratti, J. A. Berzofsky, and L. A. Pinto. 2006. Persistent human papillomavirus infection is associated with a generalized decrease in immune responsiveness in older women. Cancer Research 66: 11070-11076.

413. Belyakov, I.M., S. Kozlowski, M. Mage, J.D. Ahlers, L.F. Boyd, D.H. Margulies, and J.A. Berzofsky. 2007. Role of $\alpha 3$ domain of class I MHC molecules in the activation of high and low avidity $CD8^+$ cytotoxic T lymphocytes. *International Immunology* , In press

414. Park, J.M., M. Terabe, D.A. Donaldson, G. Forni, and J.A. Berzofsky. 2007. Natural Immunosurveillance against spontaneous, autochthonous breast cancers revealed and enhanced by blockade of IL-13-mediated negative regulation. *Cancer Immunol. Immunother.* , In press

Patent Applications Filed, Patents Issued & Technology Transfer

Berzofsky, J. A., and Kawamura, H. A method of producing improved immune response. Filed August 7, 1985. Application No. 06/763,218. CIP 07/338,362. Patent 5,283,323 issued February 1, 1994.

Berzofsky, J. A., DeLisi, C., Margalit, H., Cornette, J. L., Cease, K. B., and Spouge, J. L. Method to predict antigenic sites recognized by T lymphocytes such as for design of vaccines. Filed December 31, 1986. Application No. 06/948,255. CIP 07/005,885.

Berzofsky, J. A., Ouyang, C. S., DeLisi, C., Margalit, H., Cornette, J. L., and Cease, K. B. Synthetic peptides which induce cellular immunity to the AIDS virus and AIDS viral proteins. Filed December 30, 1986. Application No. 06/947,935. CIP 07/492,318. Patent 5,081,226 issued January 14, 1992.

Good, M. F., Berzofsky, J. A., and Miller, L. H. Improved malarial immunogen. Filed February 26, 1987. Application No. 07/019,000. Patent Number 4,886,782 issued December 12, 1989.

Berzofsky, J. A., Takahashi, H., Hosmalin, A., Germain, R. N., and Moss, B. A synthetic antigen evoking anti-HIV response. Filed January 26, 1988. Application No. 07/148,692.

Good, M. F., Kumar, S., Berzofsky, J. A., and Miller, L. H. Synthetic vaccine against P. falciparum malaria. Filed July 7, 1988. Application No. 07/216,088. Patent 5,028,425 issued July 2, 1991.

Berzofsky, J. A., Hale, P. M., Hosmalin, A., Margalit, H., Spouge, J. L., and Cornette, J. L. Synthetic vaccine against AIDS virus. Filed July 21, 1988. Application No. 07/222,684. Patent 5,030,449 issued July 9, 1991.

Berzofsky, J. A., Kurata, A., Palker, T. J., and Haynes, B. F. Immunodominant sites of HTLV-I envelope protein. Filed September 1, 1989. Application No. 07/ 401,441. Patent 5,622,703 issued April 22, 1997. Patent 5, 695,762 issued Dec. 9, 1997.

Berzofsky, J. A., Hosmalin, A., Clerici, M., Germain, R. N., Shearer, G. M., Moss, B., and Pendleton, C. D. Peptides stimulating cytotoxic T cells immune to HIV RT. Filed March 9, 1990. Application No. 07/ 489,825. Patent 5,336,758 issued August 9, 1994.

Berzofsky, J.A. Multideterminant peptide antigens that stimulate helper T lymphocyte response to HIV in a range of human subjects. Filed August 29, 1991. Application No. 07/751,998. Patent 5,939,074 issued August 17, 1999.

Berzofsky, J.A., Takahashi, H., and Germain, R.N. Method to induce cytotoxic T lymphocytes specific for a broad array of HIV-1 isolates using hybrid synthetic peptides. Filed September 18, 1991. Application No. 07/760,530. Patent 5,711,947 issued January 27, 1998; Patent 5,820,865 issued October 13, 1998.

Berzofsky, J.A., Takeshita, T., Shirai, M., Pendleton, C.D., Kozlowski, S., and Margulies, D.H. Potent peptide for stimulation of cytotoxic T lymphocytes specific for the HIV-1 envelope. Filed March 6, 1992. Application No. 07/847,311. Patent 5,976,541 issued November 2, 1999.

Shearer, G.M., Berzofsky, J.A., and Clerici, M. Test of HIV-specific T lymphocyte function that detects exposure to HIV antigens and possibly early HIV infection. Filed May 14, 1992. Application No. 07/882,078.

Berzofsky, J.A., Shirai, M., Akatsuka, T., and Feinstone, S.M. Identification of peptides that stimulate hepatitis C virus specific cytotoxic T cells. Filed June 10, 1992. Application 07/894,063. Patent 5,980,899 issued Nov. 9, 1999.

Berzofsky, J.A., Yanuck, M., Takahashi, H., Carbone, D.P., and Minna, J.D. Novel Immunotherapeutic Methods and Vaccines. Filed March 15, 1993. Application No. 08/031,494.

Berzofsky, J.A., Ahlers, J.D., Pendleton, C.D., Nara, P., and Shirai, M. Composite synthetic peptide construct eliciting neutralizing antibodies and cytotoxic T lymphocytes against HIV. Filed May 14, 1993. Application No. 08/060,988. U. S. Patent 5,932,218 issued August 3, 1999. European Patent 0701572 B1, issued August 11, 1999. Divisional: Multideterminant peptides that elicit helper T lymphocyte, cytotoxic T lymphocyte, and neutralizing antibody responses against HIV-1. U.S. Patent 6,294,322 B1 issued Sept. 25, 2001.

Berzofsky, J.A., Feinstone, S., and Shirai, M. Hepatitis C virus core peptide for stimulation of cytotoxic T lymphocytes and diagnosis of HCV exposure. Filed April 8, 1994. Application No. 08/224,973. European patent 0754193 issued June 14, 2000.

Goletz, T.J., Berzofsky, J.A., and Helman, L.J. Novel immunotherapeutic methods and vaccines. Filed September 15, 1995. Application No. 08/528,129. Notice of allowance April 14, 1999. U.S. Patent 5,997,869 issued December 7, 1999.

Klimpel, K., Goletz, T.J., Arora, N., Leppla, S.H., and Berzofsky, J.A. Targeting antigens to the MHC class I processing pathway with an Anthrax toxin fusion protein. Filed September 17, 1996. Application No. 60/025,270. US Patent 6,592,872 issued July 15, 2003.

Berzofsky, J.A., Belyakov, I.M., Derby, M.A., Kelsall, B.L., and Strober, W. Mucosal cytotoxic T lymphocyte responses. Filed September 11, 1997. Application 60/058,523. Divisional 10/815,340 filed April 15, 2004. Patent 6,749,856 issued June 15, 2004. European Patent 1011720 issued Dec. 29, 2004.

Berzofsky, J.A., Sarobe, P., Major, M., Feinstone, S.H. Modified HCV peptide vaccine. Filed Aug. 21, 1998. Application 60/097,446. Application 09/763,260 filed Oct. 19, 2001 as continuation. US Patent 6,685,944 issued February 3, 2004.

Berzofsky, J. A., M. Terabe, D. D. Donaldson, S. Matsui, N. Noben-Trauth, and W. E. Paul. Method and composition for enhancing an immune response. Filed October 20, 2000. Application 90/693,600.

Terabe, M., S. Matsui, , J.A. Berzofsky. Methods to Prevent Tumor Recurrence by Blockage of TGF-Beta. Application US 60/421,286. Filed October 25, 2002. PCT International Application PCT/US03/34023 Filed October 24, 2003.

Morris, J., J.A. Berzofsky, Y. Sakai, J.-M. Park, M. Terabe. Methods for Prophylaxis and Treatment of HER-2/neu Tumors. Provisional application filed 2002.

Perera, L. P., T. A. Waldmann, S. Oh, J. A. Berzofsky. Recombinant Vaccinia Viruses Expressing IL-15 and Methods of Using the Same. Application #: U.S. Provisional 60/433,703. Filed December 16, 2002.

Berzofsky, J. A., and T. Okazaki. Enhanced HIV-1 Vaccines and Methods for Their Use. U.S. Provisional Application 60/459,507, filed March 31, 2003.

Berzofsky, J.A., I. Pastan, S. Oh. Immunogenic Peptides and Peptide Derivatives for Prostate and Breast Cancer Treatment. Application # 60/476,467. Filed June 5, 2003. National Stage US Patent Application 10/559,329 filed December 2, 2005.

Berzofsky, J.A., J. T. Snyder, II, A. Dzutsev, and I. M. Belyakov. Peptides for the induction of an immune response to vaccinia virus and their use. Application 60/512,039. Filed October 16, 2003.

Berzofsky, J.A., I. H. Pastan, and M. Terabe. Immunogenic peptides of XAGE-1. Application # 60/529,025. Filed December 12, 2003. International PCT/US2004/041639 filed December 13, 2004.

Berzofsky, J.A., and T. Okazaki. Epitope-Enhancement of a Human CD4 HIV Epitope. Application # 60/567,073, filed on April 30, 2004

Catanzaro, A., R. Yarchoan, J. A. Berzofsky, T. Okazaki, J. T. Snyder, and S. Broder. Vaccines and Methods for Prevention and Treatment of Drug-Resistant HIV-1 and Hepatitis B Virus. Application 60/655,984 pending, filed Feb. 22, 2005.

Terabe, M., S. Takaku, and J. A. Berzofsky. Synergistic effect of TGF-beta blockade and immunogenic agents on tumors. U.S. Patent Application No. 60/654,329, filed February 17, 2005.

NIH CRADA 01361 with Genzyme Corporation (2003-date). Co-principal Investigator

Jay A. Berzofsky
Speaking and Chairmanship Invitations
1990-2007

1990

27 Jan.-3 Feb., 1990 UCLA Symposium on Cellular Immunity and the Immunotherapy of Cancer, Park City, Utah. Invited plenary session speaker.

5 Feb., 1990 Walter Reed Army Institute of Research AIDS Conference, Washington, D.C., Invited speaker.

2 March, 1990 University of Pennsylvania School of Medicine, Philadelphia, PA, seminar speaker.

1-7 April, 1990 UCLA Symposium on HIV and related Retroviruses, Keystone, CO. Invited plenary session speaker.

3-7 June, 1990 American Association of Immunologists, FASEB, Meeting, New Orleans, LA. Invited symposium chairperson (Antigen Processing and Presentation) and symposium speaker.

20-24 June, 1990 Sixth International Conference on AIDS, San Francisco, CA. Invited plenary session speaker on Vaccines.

8-12 July, 1990 Symposium on Antigen Presenting Cells organized by the University of Vienna, Baden bei Wien, Austria. Invited speaker.

11-17 Aug., 1990 Laboratory of Tumor Cell Biology Meeting on AIDS and Human Retroviruses, Bethesda, Md. Invited speaker and session chairperson.

9-12 Sept., 1990 European Federation of Immunological Societies Meeting, Edinburgh, Scotland, U.K. Invited plenary session speaker.

19 Oct., 1990 University of Massachusetts Medical School, Worcester, MA. Invited seminar speaker.

29-30 Oct., 1990 NCI Cancer Vaccine Workshop, Bethesda, MD. Invited speaker.

15-16 Nov., 1990 New Horizons in Immunology Symposium, organized by *Nature*, Boston, MA. Invited speaker.

4 Dec., 1990 National Academy of Sciences Institute of Medicine Meeting on Malaria, Washington, D. C. Invited speaker.

1991

12-17 March, 1991 Keystone Symposium on Immunotoxins, Denver, CO. Invited Plenary Speaker.

17 April, 1991 Harvard Medical School, Immunology Program, Boston, MA. Invited speaker.

3-6 May, 1991 Association of American Physicians, Seattle, WA. HIV session speaker.

17-18 May, 1991 Columbia University/Progenics Conference on AIDS, Arden House, NY. Invited speaker.

16-21 June, 1991 7th International Conference on AIDS, Florence, Italy. Invited speaker.

1-8 Sept., 1991 Laboratory of Tumor Cell Biology Retrovirus Meeting, Bethesda, MD. Invited speaker and session chariperson.

19-23 Sept., 1991 Cold Spring Harbor Vaccine Conference, Cold Spring Harbor, NY. Invited opening speaker.

15-19 Oct., 1991 Queensland Institute for Medical Research, Bancroft Center Opening Symposium, Brisbane, Queensland, Australia. Invited Plenary Keynote Speaker.

15 Nov., 1991 NIH Technology Transfer Symposium, Bethesda, MD. Invited speaker.

22 Nov., 1991 University of Virginia School of Medicine, Dept. of Microbiology, Charlottesville, VA. Invited speaker.

1992

10 January, 1992 Uniformed Services University of the Health Sciences, Bethesda, MD. Immunology course guest lecturer on Ir genes, and antigen processing and presentation.

4 February, 1992 National Cancer Institute, Experimental Immunology Branch, Bethesda, MD. Invited guest seminar speaker.

12 February, 1992 National Institute of Diabetes, Digestive, and Kidney Diseases, Laboratory of Chemical Biology, Bethesda, MD. Invited seminar speaker.

27 Mar.-4 Apr.,1992 Keystone Symposium on Prevention and Treatment of AIDS, Keystone, CO. Invited plenary speaker.

27 May, 1992 Columbia University College of Physicians and Surgeons, New York, NY. 31st Michael Heidelberger Award and Lecture.

5 June, 1992 Tufts University School of Medicine, Department of Medicine, Boston, MA. Invited Grand Rounds speaker.

13 July, 1992 National Cancer Institute, Laboratory of Tumor Cell Biology, Bethesda, MD. Invited seminar speaker.

9-16 Aug., 1992 National Cancer Institute, LTCB Annual Symposium on Human Retroviruses, Bethesda, MD. Invited speaker and session chairperson.

23-28 Aug., 1992 8th International Congress of Immunology, Budapest, Hungary. Invited chairperson of Workshop on Antigen Processing and Presentation, and speaker.

29-31 Aug., 1992 Symposium on Prediction and Recognition of Antigenic Determinants, Eötvös University, Budapest, Hungary. Invited plenary speaker and chairperson.

21-22 Sept., 1992 NIH Research Festival, Bethesda, MD. Invited session chairperson and speaker.

19-20 Oct., 1992 University of Texas Medical Branch, Galveston, TX. McLaughlin Visiting Professor.

20-23 Oct., 1992 54th Annual MD Anderson Symposium on the Immunobiology of Cancer, Houston, TX. Invited plenary speaker.

1993

21-24 Jan., 1993 New York Academy of Sciences Symposium on the Specific Immune Treatment of Cancer, Washington, DC. Invited plenary speaker.

8-14 Feb., 1993 Keystone Symposium on Antigen Processing and Presentation, Taos, NM, Invited plenary speaker.

17-24 March, 1993 Joint Keystone Symposia on Cellular Immunity and Immunotherapy of Cancer, and on the Molecular Immunology of Virus Infections, Taos, NM. Invited joint plenary session speaker.

19-29 April, 1993 CBER-FDA Workshop on HIV Vaccines, Bethesda, MD. Invited speaker.

28-30 July, 1993 FDA Workshop on Combination Vaccines, Bethesda, MD. Invited speaker.

22-28 Aug., 1993 Laboratory of Tumor Cell Biology Annual Retrovirus Meeting, Bethesda, MD. Invited speaker and chairperson.

20-24 Sept., 1993 Cold Spring Harbor Symposium on Vaccines including the Prevention and Treatment of AIDS, Cold Spring Harbor, NY. Invited opening plenary speaker.

1-4 Nov., 1993 National Cooperative Vaccine Development Meeting on Advances in AIDS Vaccine Development, Division of AIDS, NIAID, Alexandria, VA. Invited speaker.

5-7 Nov., 1993 Project Inform/Immune Restoration Think Tank on HIV Treatment, Baltimore, MD. Invited Discussant.

10 Dec., 1993 Institute of Medicine Symposium "Towards an Understanding of the Correlates of Protective Immunity to HIV Infection," Washington, DC. Invited participant.

1994

23-30 Jan., 1994 Keystone Symposium on HIV, Hilton Head Island, SC. Invited plenary speaker.

13-30 Feb., 1994 Keystone Symposium on Human Tumor Viruses, Taos, NM. Invited plenary speaker.

29 Apr.-2 May, 1994 American Society for Clinical Investigation, Baltimore, MD. Presidential address.

18-19 July, 1994 Conference on Novel HIV Vaccine Strategies, Washington, D.C. Invited plenary speaker.

19-21 Sept., 1994 NIH Research Festival, Bethesda, MD. Invited speaker.

25-30 Sept., 1994 Laboratory of Tumor Cell Biology Annual Retrovirus Meeting, Bethesda, MD. Invited speaker and chairperson.

5-9 Oct., 1994 Cold Spring Harbor Meeting on Molecular Approaches to the Control of Infectious Diseases, Cold Spring Harbor, NY. Invited keynote speaker.

1995

16-23 Jan., 1995 Keystone Symposium on Molecular Aspects of Viral Immunity, Keystone, CO. Invited plenary speaker.

25-27 Jan., 1995 Jennifer Jones Simon Foundation Workshop on Cancer Immunotherapy, Los Angeles, CA. Invited discussant.

29 Jan-2 Feb, 1995 American Society for Microbiology Second National Conference on Human Retroviruses and Related Infections, Washington, DC. Invited speaker.

9 Feb., 1995 National Cancer Institute, Pediatric Oncology Branch, NIH, Bethesda, MD. Invited seminar speaker.

3-5 Mar., 1995 Second International Conference on Engineered Vaccines for AIDS and Cancer, San Francisco, CA. Invited plenary speaker.

19 May, 1995 University of Michigan, Dept. of Medicine, Ann Arbor, MI. Ground Rounds speaker.

23-29 July, 1995 9th International Congress of Immunology, San Francisco, CA. Invited plenary symposium chairperson and speaker.

27 Aug-2Sept,1995 Laboratory of Tumor Cell Biology Annual Retrovirus Meeting, Bethesda, MD. Invited chairperson and speaker.

6-9 Sept., 1995 Queensland Institute for Medical Research Golden Jubilee Symposium, Brisbane, Australia. Invited plenary speaker.

10-23 Sept., 1995 Australasian Society for Immunology Visiting Speaker, Melbourne, Canberra, and Sydney, Australia, and Dunedin and Auckland, New Zealand.

10 Nov., 1995 Emory University, Dept. of Microbiology and Immunology, Atlanta, GA. Invited seminar speaker.

30 Nov-3 Dec,1995 First International Antigen Processing and Presentation Conference: Fundamental Mechanisms and their Application, Los Angeles, CA. Invited speaker.

16-19 Dec., 1995 Winter Advanced Course in Immunology and Infectious Disease, Tsuruoka, Japan. Invited faculty member/speaker.

1996

26-27 Feb., 1996 IBC Vaccine Technology Conference, Washington, DC. Invited speaker

25 Mar., 1996 CHI Symposium on New Cancer Strategies: p53 Diagnostics and Therapy, Washington, DC. Invited speaker.

26 Mar., 1996 Institute of Medicine Vaccine Workshop, Washington, DC. Invited speaker.

17-20 Apr., 1996 British Society for Immunology Jenner Bicentennary Symposium, Bristol, UK. Invited plenary speaker.

7-13 Sept., 1996 Institute of Human Virology Annual Retrovirus Meeting, Baltimore, MD. Invited speaker.

1-3 Oct., 1996 NIH Intramural Immunology Retreat, Airlie, VA. Invited workshop chair.

25-27 Oct., 1996 University of Rome Cancer Immunotherapy Symposium, Rome, Italy. Invited speaker.

23-27 Nov., 1996 Japan Immunology Society Jenner Bicentennary Symposium, Yokohama, Japan. Invited plenary speaker.

1997

22 Jan., 1997 AIDS Malignancies Working Group Symposium, Washington, DC. Invited speaker.

1-7 Feb., 1997 Keystone Symposium on Cellular Immunology and Immunotherapy of Cancer, Copper Mountain, CO. Invited plenary speaker.

3-4 Mar., 1997 University of Alabama at Birmingham, Dept. of Medicine Trainee Research Symposium, Invited Keynote Speaker.

23-25 Mar., 1997 Symposium on Immunogenicity of Proteins, Genentech, South San Francisco, CA. Invited speaker.

9 Apr., 1997 NCI Grand Rounds Speaker, Bethesda, MD (Construction of Engineered Vaccines for HIV).

13-19 Apr., 1997 Keystone Symposium on Tolerance and Autoimmunity, Keystone, CO. Invited workshop chair.

30 Apr.-2 May, 1997 2nd National Symposium on Basic Aspects of Vaccines, Bethesda, MD. Invited session chairperson and plenary speaker.

15-21 Sept., 1997 Institute of Human Virology Annual Meeting, Baltimore, MD. Invited State-of-Art Lecturer.

1998

14 Jan., 1998 NIDR Invited Lecture, Bethesda, MD.

5-8 March, 1998 UCLA Symposium "Towards an HIV Vaccine: Immunopathogenesis of HIV Infection," Palm Springs, CA. Invited plenary speaker.

13-19 March, 1998 Keystone Symposium on HIV Pathogenesis and Treatment, Park City, Utah. Invited speaker.

27 March, 1998 Georgetown University Lombardi Cancer Center, Washington, D.C. Invited speaker.

3 June, 1998 Wistar Institute, University of Pennsylvania, Philadelphia, PA. Invited speaker.

16 June, 1998 Bio'98 Symposium, New York, NY. Invited symposium speaker.

23-29 Aug., 1998 Institute of Human Virology Annual Meeting, Baltimore, MD. Invited State-of-Art Lecturer

18-22 Oct., 1998 5th International Union of Biochemistry and Molecular Biology Conference on the Biochemistry of Health and Disease, Jerusalem, Israel. Invited Symposium Speaker.

25 Oct., 1998 Weizmann Institute of Science, Rehovot, Israel, Invited seminar speaker.

26 Oct., 1998 University of London Medical School, Guy's Hospital, Invited seminar speaker.

1-6 Nov., 1998 10th International Congress of Immunology, New Delhi, India. Invited Symposium Speaker.

18-20 Nov., 1998 NMHCC Conference on Functional Antigenics, Washington, D.C. Invited speaker.

10-11 Dec., 1998 FDA-NCI Workshop on Tumor Vaccines, Bethesda, MD. Invited speaker.

1999

7-13 Jan., 1999 Keystone Symposium on HIV Vaccine Development, Keystone, CO. Invited speaker

16 March, 1999 University of Pittsburgh School of Medicine, Invited seminar speaker

12-17 April, 1999 Keystone Symposium on DNA Vaccines, Snowbird, Utah. Co-organizer and invited plenary speaker.

21-23 April, 1999 5th National Symposium on the Basic Aspects of Vaccines, Bethesda, MD. Invited plenary session chair and speaker.

6 May, 1999 Workshop on Alloimmunization as a Strategy for Vaccine Design against HIV/AIDS, Bethesda, MD. Invited speaker.

7-9 June, 1999 6th International Symposium on Hepatitis C and Related Viruses, Bethesda, MD. Invited plenary speaker.

30 Aug-3 Sept 1999 State-of-Art Institute of Human Virology Annual Meeting, Baltimore, MD. Invited Lecturer

8-10 Sept., 1999 International Congress on Cytokines, Bethesda, MD. Invited speaker.

13 Dec., 1999 Hôpital Cochin INSERM Unit, Paris, France. Invited seminar speaker.

13-15 Dec., 1999 Invited Club Francophone des Cellules Dendritiques Symposium, Paris, France. plenary speaker.

2000

21-27 Jan., 2000 Keystone Symposium on Cellular Immunology and Immunotherapy of Cancer, Santa Fe, NM, Invited Workshop Chairperson and speaker.

8-12 March, 2000 2nd Sabin Vaccine Foundation Walker's Cay Colloquium on Immunotherapy of Cancer, Invited Speaker

6 April, 2000 New York Blood Center, New York, NY. Invited seminar speaker.

3-5 May, 2000 6th National Symposium on the Basic Aspects of Vaccines, Bethesda, MD. Invited plenary session chair and speaker.

11 May, 2000 NIH Cytokine Symposium, Bethesda, MD. Invited Speaker

12-16 July, 2000 Mid-Summer Sympoisum on Hepatitis C Virus Vaccines, Jamaica. Invited speaker and session organizer/chair

10-15 Sept., 2000 Inst. of Human Virology Annual Mtg, Baltimore, MD. Invited State-of-Art Lecturer

22 Sept., 2000 NCI Symposium on Bench to Bedside and Back, Basic and Translational Biomedical Research, Bethesda, MD. Organizer and Chair.

2 Nov., 2000 NIH Collaborative Meeting on HIV Vaccines, Bethesda, MD. Invited Speaker.

7-8 Dec., 2000 Forum for Collaborative HIV Research/ George Washington University Workshop on Immune-Based Therapies and HIV Disease, Washington, DC. Invited discussant.

2001

10 January, 2001	Institute of Human Virology, Baltimore, MD. Invited seminar speaker.
17-18 Jan., 2001	Genetics Institute, Cambridge, MA. Invited seminar speaker.
22-27 Jan., 2001	Keystone Symposium on the Interface between Innate and Adaptive Immunity, Keystone, CO. Invited plenary session speaker.
4-8 Feb., 2001	8th Conference on Retroviruses and Opportunistic Infections, Chicago, IL. Invited symposium speaker.
7-10 Mar., 2001	3rd Walker's Cay Colloquium on Cancer Vaccines and Immunotherapy, Sabin Vaccine Institute, Walker's Cay, Bahamas. Invited speaker.
28 Mar.-3 Apr., 2001	Keystone Symposium on AIDS Vaccines in the New Millenium, Keystone, CO. Invited plenary session speaker.
1 May, 2001	Vaccine Research Center, NIH, Bethesda, MD. Invited seminar speaker.
2-4 May, 2001	7th National Symposium on Basic Aspects of Vaccines, Bethesda, MD. Organizing committee.
4-7 May, 2001	Federation of Clinical Immunology Societies (FOCIS) Meeting, Boston, MA. Invited plenary session speaker.
2 July,. 2001	Celera Genomics, Inc., Rockville, MD. Invited seminar speaker.
22-28 July, 2001	11th International Congress of Immunology, Stockholm, Sweden. Invited workshop chair.
27 Aug. 2001	IDEC Pharmaceuticals, La Jolla, CA. Invited seminar speaker.
9-13 Sept., 2001	International Meeting of the Institute of Human Virology, Baltimore, MD. Invited plenary session speaker.
27-31 Oct., 2001	13th Cent Gardes Symposium on Retroviruses of Human AIDS and Related Animal Diseases, Annecy, France. Invited speaker.
28 Nov.- 2 Dec., 2001	3rd Midwinter Symposium on Hepatitis C Virus, Barbados. Invited speaker and chairperson.
18 Dec., 2001.	Pulmonary Branch, National Heart, Lung, & Blood Institute Seminar, Bethesda, MD. Invited speaker.

2002

16-22 Jan., 2002	Keystone Symposium on T Lymphocyte Activation, Differentiation, and Death, Keystone, CO. Invited plenary speaker.
6-10 March, 2002	Fourth Walker's Cay Colloquium on Cancer Vaccines and Immunotherapy, Walkers Cay, Bahamas. Invited speaker.
5-11 April, 2002	Keystone Symposium on HIV-1 Protection and Control by Vaccination, Keystone, CO. Invited plenary speaker.
10-15 April, 2002	Keystone Symposium on Gene-Based Vaccines, Breckenridge, CO. Co-organizer and invited plenary speaker.
22-24 April, 2002	International Meeting on Cytokines as Natural Adjuvants: Perspectives for Vaccine Development, Rome, Italy. Invited plenary speaker.
1-3 May, 2002	8th National Symposium on Basic Aspects of Vaccines, Bethesda, MD. Organizing committee
10 May, 2002	International Immunological Readouts Meeting (Workshop), Bethesda, MD. Invited speaker.
26 June, 2002	American Association of Immunologists Introductory Course in Immunology, Tufts University, Medford, MA. Invited lecturer.
27-31 July, 2002	FASEB Summer Research Conference on Therapeutic and Preventive AIDS Vaccines, Tuscon, AZ. Invited plenary speaker.
9-13 Sept., 2002	International Meeting of the Institute of Human Virology, Baltimore, MD. Invited plenary session speaker.
23-25 Oct., 2002	DNA Vaccines 2002, Royal College of Physicians, Edinburgh, Scotland. Invited plenary speaker.
26-29 Oct., 2002	XIIIth Cent Gardes Meeting on HIV and AIDS Vaccines, Annecy, France. Invited plenary speaker.
5-8 Nov., 2002	2nd International Workshop on CD1 Antigen Presentation and NK T Cells, Woods Hole, MA. Invited speaker.
18-23 Nov., 2002	BioSecurity 2002: Vaccines: The Paradigm Quake, Las Vagas, NV. Invited speaker.
25-27 Nov., 2002	Pan American Health Organization Centennial Celebration Conference on Vaccines, Washington, DC. Invited plenary speaker.

2003

7 Jan., 2003	NIH Academy, Invited speaker.
15-19 Jan., 2003	AACR Special Conference in Cancer Research: The TGF-β superfamily—roles in the pathogenesis of cancer and other diseases, La Jolla, CA. Invited plenary speaker.
23-24 Jan., 2003	AAI/NCI Workshop on Cancer Immunology, Bethesda, MD. Invited participant.
27 Jan., 2003	University of Chicago Committee on Immunology Seminars, Chicago, IL. Invited speaker
17-23 Feb., 2003	Keystone Symposium on Basic Aspects of Tumor Immunology, Keystone, CO. Invited speaker.
5-8 March, 2003	Sabin Vaccine Institute 5th Walker's Cay Colloquium on Cancer Vaccines and Immunotherapy, Walker's Cay, Bahamas. Invited speaker.
13 March, 2003	Experimental Transplantation Branch, CCR, NCI, Bethesda, MD. Invited seminar speaker.
28 Mar-4 Apr., 2003	Keystone Symposium on HIV Vaccine Development, Banff, Alberta, Canada. Invited speaker.
23-24 April, 2003	Kunkel Society of Rockefeller University Annual Meeting, New York, NY. Invited plenary speaker.
30 Apr.-2 May, 2003	9th WRAIR National Symposium on Basic Aspects of Vaccines, Bethesda, MD. Organizing committee
15-19 May, 2003	3rd Annual Meeting of the Federation of Clinical Immunological Societies (FOCIS), Paris, France. Invited speaker.
20 May, 2003	American Society for Microbiology Annual Meeting, Washington, DC. Invited symposium speaker.
1-2 June, 2003	Nobel Forum on Vaccines and Immunotherapy, Stockholm, Sweden. Invited plenary speaker.
29 Sept.-3 Oct., 2003	International Meeting of the Institute of Human Virology, Baltimore, MD. Invited plenary session speaker, special lecture.
14-17 Oct., 2003	MD Anderson 56th Annual Symposium on Fundamental Cancer Research: Cancer Immunity: Challenges for the Next Decade, Houston, TX. Invited plenary speaker.

1 Dec., 2003	USDA Agricultural Research Service National Immunology Conference, Bethesda, MD. Invited Keynote Speaker.

2004

6-11 Jan., 2004	Keystone Symposium on Rational Design of Vaccines and Immunotherapeutics, Keystone, CO. Invited plenary speaker.
25-30 Mar, 2004	Keystone Symposium on Immune Evasion, Taos, NM. Invited plenary speaker.
17-21 Apr, 2004	American Association of Immunologists Annual Meeting, Washington, DC. Invited Symposium Chairperson and Speaker.
29-30 Apr, 2004	10th WRAIR National Symposium on Basic Aspects of Vaccines, Bethesda, MD. Invited Symposium Chairperson and Speaker.
13-15 June, 2004	International Workshop on Cancer Vaccines, Siena, Italy. Invited plenary speaker.
15-18 June, 2004	International Colloquium on Innate and Adaptive Immunity after Transcutaneous or Mucosal Vaccination, Veyrier du Lac, France. Invited plenary speaker.
18-24 July, 2004	12th International Congress of Immunology and 4th Annual Conference of the Federation of Clinical Immunological Societies, Montreal, Canada. Invited minisymposium speaker.
6 Sept., 2004	Queensland Institute of Medical Research, Brisbane, Australia. Invited seminar speaker.
8-13 Sept, 2004	3rd International Workshop on NKT Cells and CD1-mediated Antigen Presentation, Heron Island, Australia. Invited plenary speaker.
10-13 Oct, 2004	International Symposium on Tumor Escape and Its Determinants, Salzburg, Austria. Invited plenary speaker.
31 Oct-4 Nov, 2004	International Meeting of the Institute of Human Virology, Baltimore, MD. Invited Symposium Chairperson and Speaker.
17 Nov, 2004	The 2004 Tadeusz J. Wiktor Memorial Lecture, Wistar Institute, University of Pennsylvania, Philadelphia, PA.

2005

19-24 March, 2005	Keystone Symposium on Basic Aspects of Tumor Immunology, Keystone, CO. Invited Speaker and workshop chair.
29 Aug-2 Sept, 2005	International Meeting of the Institute of Human Virology, Baltimore, MD. Invited Symposium Chairperson and Featured Speaker
19-21 Sept, 2005	NIH Immunology Interest Group Retreat, Airlie, VA. Invited session chair and organizer.
22-23 Sept, 2005	International NCI Symposium on Translational Immunology Related to Cancer, Bethesda, MD. Organizer, Session Chair, and Plenary Speaker.
24 Oct., 2005	Albert Einstein College of Medicine, Bronx, NY. Invited seminar speaker.
10-11 Nov, 2005	CHAVI Conference on Mucosal Immunity and Vaccines, Duke University, Durham, NC. Invited plenary speaker.
16-19 Nov, 2005	First International Dead Sea Conclave on HIV and Cancer Vaccines, Dead Sea, Jordan Valley Marriott Resort and Conference Center, Jordan. Invited session chair and plenary speaker.
13-14 Dec, 2005	Boston University International Conference on Biodefense, Boston, MA. Invited plenary speaker.
16 Dec, 2005	Laboratory of Experimental Immunology, Frederick Cancer Research and Development Center, CCR, NCI. Invited seminar speaker.

2006

5-7 Feb, 2006	Hasumi Foundation International Symposium on Cancer Vaccines, Bethesda, MD. Invited Plenary Speaker.
9 Feb, 2006	NCI Symposium on Inflammation and Colon Cancer, Bethesda, MD. Invited panel discussant.
5-9 March, 2006	American Association for Asthma, Allergy, and Immunology Annual Meeting, Miami Beach, FL. Invited Plenary Speaker.
26-29 May, 2006	International Symposium on Cancer Vaccines, Naples, Italy. Invited Plenary Speaker.
4-8 Oct., 2006	International Conference on NKT Cells and CD1, Siena, Italy. Invited speaker.

30 Oct., 2006	Symposium on IL-15 and Immunotherapy, Bethesda, MD. Invited speaker.
17-21 Nov, 2006	10th International Meeting of the Institute of Human Virology, Baltimore, MD. Invited plenary speaker and session chair.

2007

25-28 Jan, 2007	Symposium on Immune Suppression in Cancer, Moffitt Cancer Research Center, Tampa, FL. Invited plenary speaker.
1 Feb, 2007	International Society for Cutaneous Lymphoma, Herschel Zackheim Memorial Lecture and Award.
8-9 Feb, 2007	FDA-NCI Cancer Immunotherapy workshop, Organizer and session Chair
15-19 Feb, 2007	American Association for the Advancement of Sciences (AAAS) Annual Meeting, San Francisco, CA. Chair-elect of Medical Sciences Section.
17-18 March, 2007	Symposium on Two Decades of Predictive Biology, Boston University, Boston, MA. Invited plenary speaker
21-23 March, 2007	Symposium on Viruses, Genes and Cancer, Venice, Italy. Invited plenary speaker.
12-14 April, 2007	International Cancer Vaccine Symposium, Vienna, Austria. Invited plenary speaker.
12-14 April, 2007	Third Vienna Vaccines Conference, Baden, Austria. Invited plenary speaker.
18-22 May, 2007	94th Annual Meeting of the American Association of Immunologists, Miami Beach, FL. Invited symposium speaker.
12-13 July, 2007	NCI Immunotherapy Workshop, Bethesda, MD. Invited speaker.
23 July, 2007	Viral Immunology Symposium, Johns Hopkins University School of Public Heath, Baltimore, MD. Invited plenary speaker.
9-11 Sept. 2007	Nobel Forum on Progress in Vaccines against Cancer, Stockholm, Sweden. Invited plenary speaker.
27 Sept, 2007	University of Pittsburgh, Pittsburgh, PA. Invited seminar speaker.
9-10 Oct., 2007	NCI Center of Excellence in Immunology Symposium on Cancer and Inflammation, Bethesda, MD. Organizing committee and session chair.

28-30 Oct., 2007	ANRS and NIH Symposium on Mucosal Immunity and HIV/AIDS Vaccines, Annecy, France. Invited plenary speaker.
1-2 Nov., 2007	NCI Symposium on HIV and AIDS Research, Bethesda, MD. Organizing committee and speaker and session chair.